THE BUILDER

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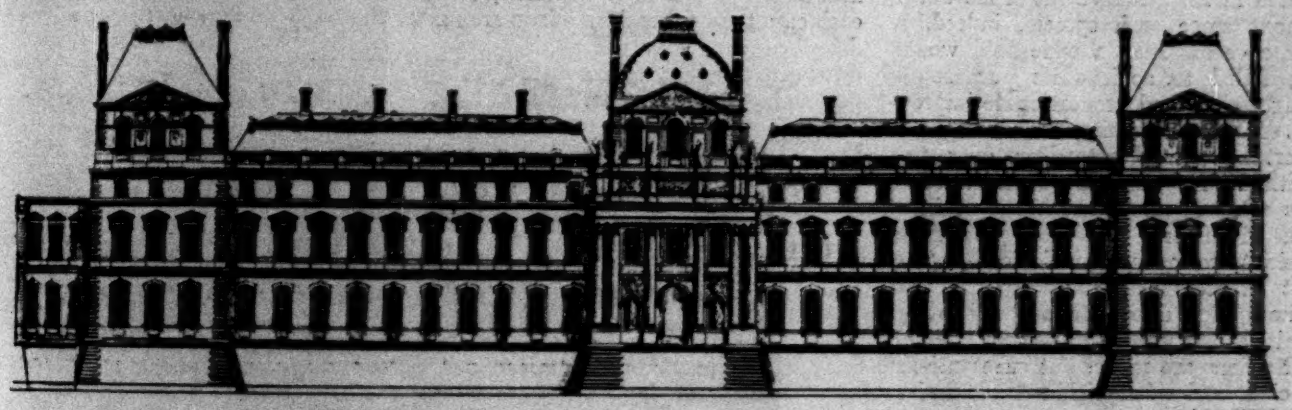
National Museum of Wales, Cardiff. Design by Messrs. H. V. Lanchester, F.R.I.B.A., & E. A. Rickards, F.R.I.B.A.

Sennowe Park, Norfolk. Mr. G. J. Skipper, F.R.I.B.A., Architect.

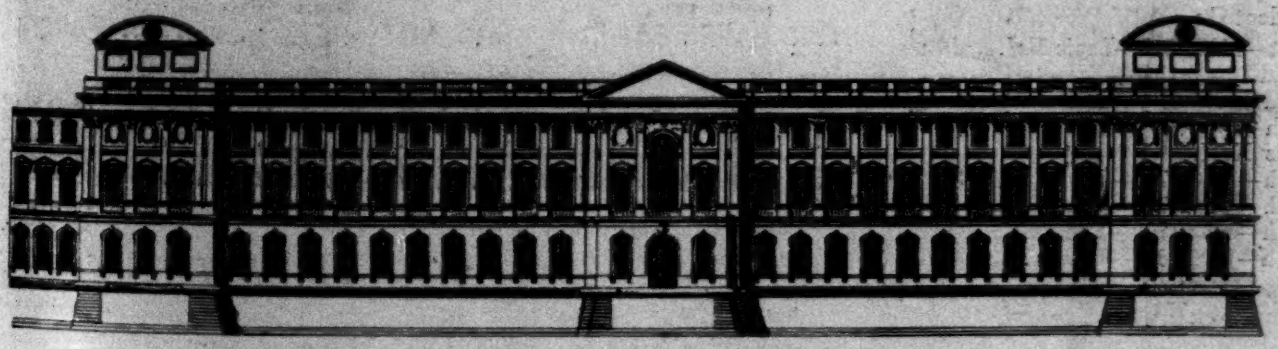
Recreation Hall, Southall. Messrs. A. Marshall Mackenzie, A.R.S.A., and A. G. R. Mackenzie, A.R.I.B.A., Architects.

Moselle Bridge, Coblenz.

New Bridge, Mayence.



The Louvre (South Front) as completed by Le Vau (1664). From Marot.



The Louvre (South Front) as refaced by Perrault (1667-80). From Marot.

From Mr. W. H. Ward's "The Architecture of the Renaissance in France." (B. T. Batsford.)

THE RENAISSANCE IN FRANCE.*

PROBABLY no phase of the Renaissance was so complex and subjected to so many conflicting influences as that which developed in France. In Italy the domination of the Classic remains quite overshadowed the relatively weak Gothic tradition. In Germany the earlier buildings of this age retained more of the vernacular, and are less indebted to ideas imported from elsewhere, while Spain and Portugal alone show the influence of forces that failed to penetrate into France. As for our own country, nearly all our Renaissance architecture owes its characteristics to one or other of the intermediate countries, and, while several routes by which it reached us can be traced, it cannot be contended that it shows the same quality of conflict and gradual assimilation of varying ideals in the subtle and intricate manner to be found in contemporary architecture in France.

France, with its high technical achievement in mediæval buildings, offers an example of the effect of a sudden importation of utterly dissimilar conceptions of architecture on a skilful and well-trained body of artizans; and the way in which this inflowing wave gradually overcomes the national tradition in some directions, while it expends itself in vain in others, affords the material for many interesting studies.

The difficulties in the path of one setting himself the task of dealing adequately with the subject can only be realised on reading such a work as that from the pen of Mr. W. H. Ward which has just been published. As our readers are probably aware, it would be difficult to find an author better qualified to deal with this architectural development. Mr. Ward's "French Châteaux" and other historical researches must have formed useful preliminary studies for this more comprehensive work. In a subject having so broad a platform it is a difficult task to determine a scheme of arrangement. Geographical, chronological, biographical, and other methods all have their claims to recognition, and the adoption of any one of these to the exclusion of the others at once makes any adequate treatment impossible.

Mr. Ward has, we think, displayed very

* "The Architecture of the Renaissance in France, 1495–1830." By W. H. Ward, M.A., A.R.I.B.A. Two volumes, large octavo. London: B. T. Batsford. 36s. net.

The Châtelet, Chantilly. By Jean Bullant.

sound judgment in the system he has adopted in the arrangement of his work. Without some such system, indeed, a work covering such a wide field would have failed to achieve its purpose of giving a clear and proportionate impression of French architecture during the important period extending over the XVIth, XVIIth, and XVIIIth centuries.

As must obviously be the case in a work of history, the most important divisions are made chronologically. The eight chapters that make up the two volumes each deal with a style having definite characteristics of its own. Minor subdivisions are made, but substantially the eight styles fall within the following periods, and the usual nomenclature, viz., that of the monarch at the time, is adopted:—

1st—1495-1515—Louis XII.
2nd—1515-1545—Francis I.
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5th—1640-1710—Louis XIV.
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7th—1730-1790—Louis XVI.
8th—1790-1830—Empire.

Each chapter opens with a brief but telling sketch of the general history of the period. Then we find descriptive notes on the architectural characteristics of the work of the time, and following this the most important buildings are described. They are grouped under two headings—"Secular" and "Church." In each case the principal buildings are first described and those of less importance dealt with together, having regard to their geographical distribution.

Château of Rougemont.

When, later on, the recognition of the individual architect becomes general, the attribution of buildings to their authors forms the basis of arrangement, and the biographical method comes more into use. We find most admirable the method by which, while a general consistency of treatment runs through the whole work, the author avoids a slavish adherence to mechanical routine, and adapts his method of exposition to the circumstances of the period.

If we have appeared to dwell at undue length on the structural form of Mr. Ward's work our excuse must be that we rarely find books of this character which combine so happily the systematic arrangement of the text-book with the flexibility of method that alone can suggest sympathetically the spirit of each successive development.

These two volumes, handy in their size, containing over 500 pages with 465 illustrations, cover the wide area of their subject in a way that would hardly have been expected from their small bulk. This compression has been effected by a most careful study of proportionate interest both in the text and in the scale of the illustrations, and the result reflects the greatest credit on the author. Only a most thorough and comprehensive knowledge would have enabled him to deal with his subject in such a concise and at the same time interesting fashion.

Hôtel de Salm: River Front.

The Introduction opens with a review of the conditions in France immediately prior to the Renaissance, and goes on to indicate in outline the earlier influences opening the way to its advent from Italy. Following the fluctuations of its varying fortunes, we see from time to time fresh developments either evolved from within or due to external influences from one direction or another. Dealing with the revival of the pure Classic school in the XVIIth century, Mr. Ward aptly likens this admixture of motives to the stock and the graft:—

"The native element supplies the sap, the life, without which the graft must perish. But it is by virtue of the graft, an importation from outside, yet remotely of its own kin, that the tree is saved from running to waste and enabled to bear a crop of fragrant blossom and mellow fruit. Though the detail and typical features of the native element soon disappeared, yet the principle which underlay them remained. It survived in many characteristic arrangements, in the insistence on verticality, in endeavours to express actual construction and plan in the architectural treatment, and in the consequent soaring and picturesque effects. The imported element brought with it the love of the horizontal line, the idealism which does not scruple to imitate or retain, for their intrinsic beauty, forms once originated by structural needs, but afterwards elaborated into objects of admiration for their own sake."

In Chapter I. we see the results of the French invasions of Italy under Charles VIII. and Louis XII., the establishment of Italian craftsmen at Amboise, and the influence of this school on the French artizan. The Lombard character of this earlier work is contrasted with the stronger influence of Rome to which reference is made in Chapter II., where we come to Francis I. and his imported Italians at work on Fontainebleau. During this reign the position of the director of works as architect became more clearly defined, and the influence of such men as Il Rosso, Serlio, and Primaticcio in forming the style of Henry II. is traced in the commencement of Chapter III. Further on we read of the almost contemporaneous rise of the distinguished French architects, Jean Goujon, Philibert de l'Orme, Jacques Androuet du Cerceau, Pierre Lescot, and Jean Bullant. Mr. Ward points out that, while these men shared with the Italians the versatility that enabled them to practise two or more arts, they differed from them in that they broke less completely with Gothic tradition and had less mastery of the principles of Classic design, while their firmer grasp of construction made it of greater importance as influencing their designs.

During this period the individuality of the artist was more marked than during the subsequent reigns, when, after a period of anarchy, the restoration of a strong government brought in its train a system of uniformity that crushed the individualistic spirit. Thus we reach in Chapter IV. the times of Henry IV. and Louis XIII. The work under these kings displays less imagination than the previous phases of the French Renaissance, and in the author's words: "Economy, sobriety, and reason are admirable as steadying forces, but they are insufficient as an inspiration," consequently artists still turned to Rome for models on which to base their designs. The characteristics of the works of these reigns are summed up as follows:—

> "If the average buildings of the age of Henry IV. and Louis XIII. rarely possess the finer qualities of distinction and grace, they derive a certain charm from that air of repose, solidity, and substantial comfort which they share with the domestic architecture of England and Holland of a little later date, while in the hands of the greater masters the style is capable of considerable grandeur. Its system of decoration is undeniably grotesque and lacking in refinement, but equally undeniably it has genuine decorative qualities of a vigorous and original character."

Chapter V., in dealing with the long reign of Louis XIV., divides it into three periods—the first marked by the growth of the classical spirit, and an increase in refinement and concentration, resulting in the formation of a new style; the second in which this matured style receives its most brilliant expression; and the third, which is characterised by a decline not in the quality of architecture, but in the unity of its aim. Free, unclassical, naturalistic tendencies, temporarily repressed, once more raise their heads.

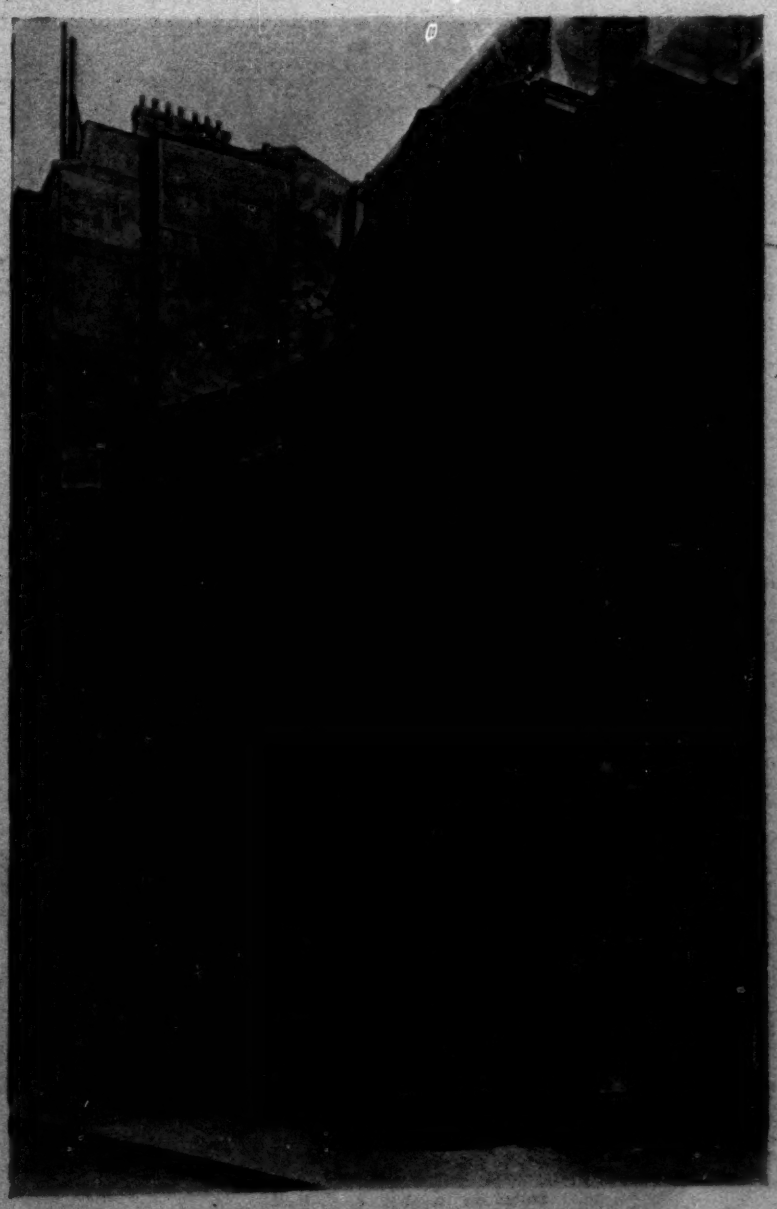
The work of Perrault at the Louvre (see illustration on page 319) displays the tendency towards dignified severity, while under J. H. Mansart and his pupils architecture passed on from this phase towards variety and gaiety, qualities that had previously begun to show themselves in decoration even while the architectural lines remained severe.

In Chapter VI. we are brought to the amazing development of decorative ornament identified with the reign of Louis XV. Even the reaction from the severity of the official architecture of Louis XIV. hardly seems sufficient to account for the remarkable quality in the types of design denominated "Régence," "Rocaille," and Rococo. We have always felt the difficulty of realising the genesis of this rapid break away from tradition—more especially in view of the originality it displays in the treatment of form. Beyond making it clear that it seems to have taken contemporary artists almost as much by surprise, and exercised the wits of the Academy as to how far it should be recognised, Mr. Ward does not quite clear up the question. He is careful, however, to point out the foreign influences, and takes note of the fact that in France structural architecture was far less affected than in the rest of Europe.

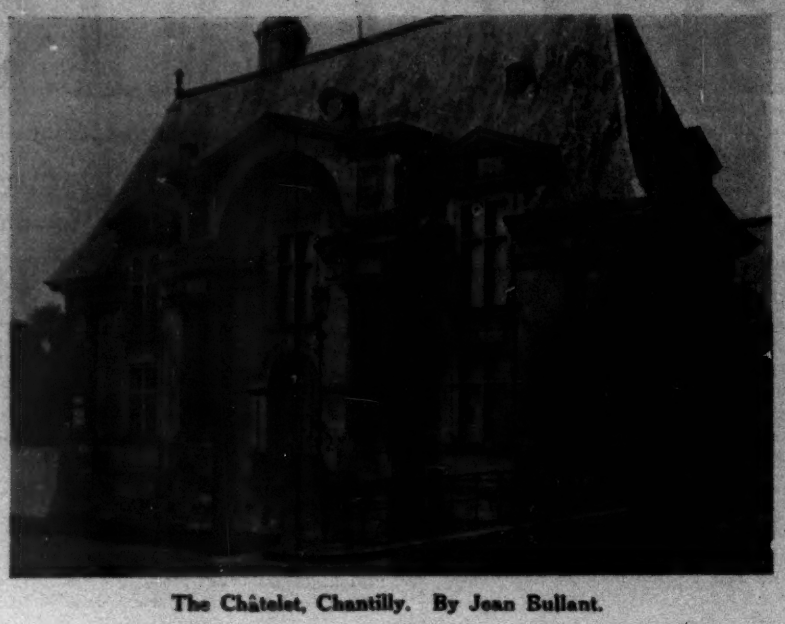
The fall of this style is almost as dramatic as its rise; but for a few lingering examples of later years, the change took place in 1750, and, as may be realised from Chapter VII. of our book, the style of Louis XVI. took up the traditions of that of Louis XIV., almost completely skipping over those immediately preceding it. Thus some fifty years covers the whole life of one of the most remarkable expositions of decorative art the world has ever seen.

Mr. Ward accepts the usual claim of the reign of Louis XVI. to give its name to a style, but qualifies this by the admission that the style so named was, in a large measure, the creation of the two architects—Jean Nicholas Servandony (1695-1766) and Jacques Germain Soufflot (1714-80), both citizens of Lyons, a city always in close contact with Italian thought.

The last chapter on the style of the Empire dismisses it somewhat briefly, but it may be that, despite some fine works belonging to this period, one cannot pursue the study of so vital a development as the Renaissance in France without feeling that it dies out in a dry scholasticism, and that its latter days fail to excite the interest evoked by those ages when knowledge counted for less and imagination for more.



Paris: Fontaine de Grenelle. By E. Bouchardon (1739).



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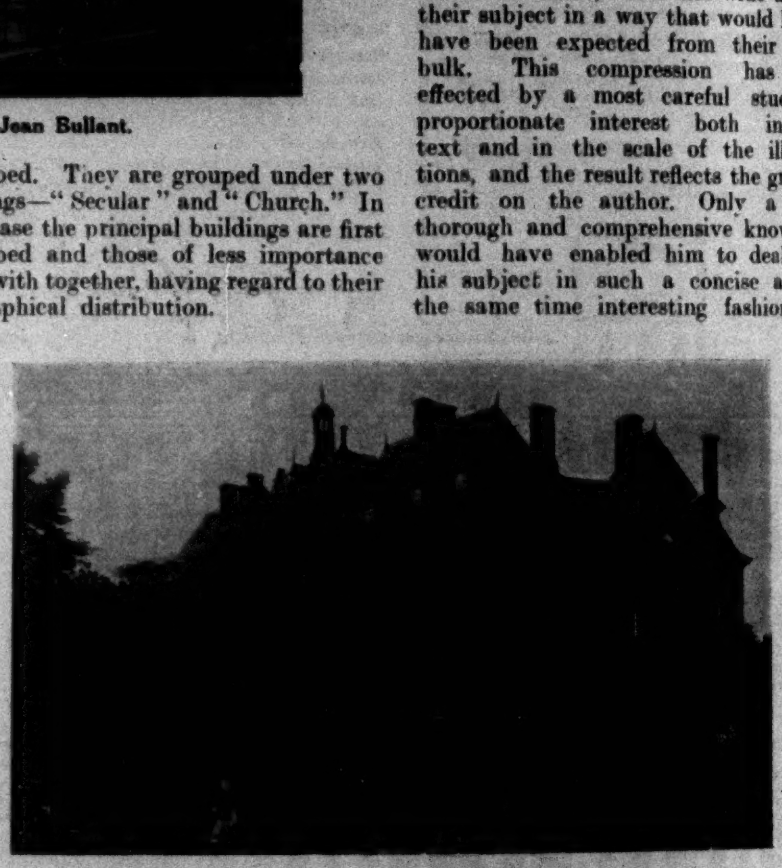

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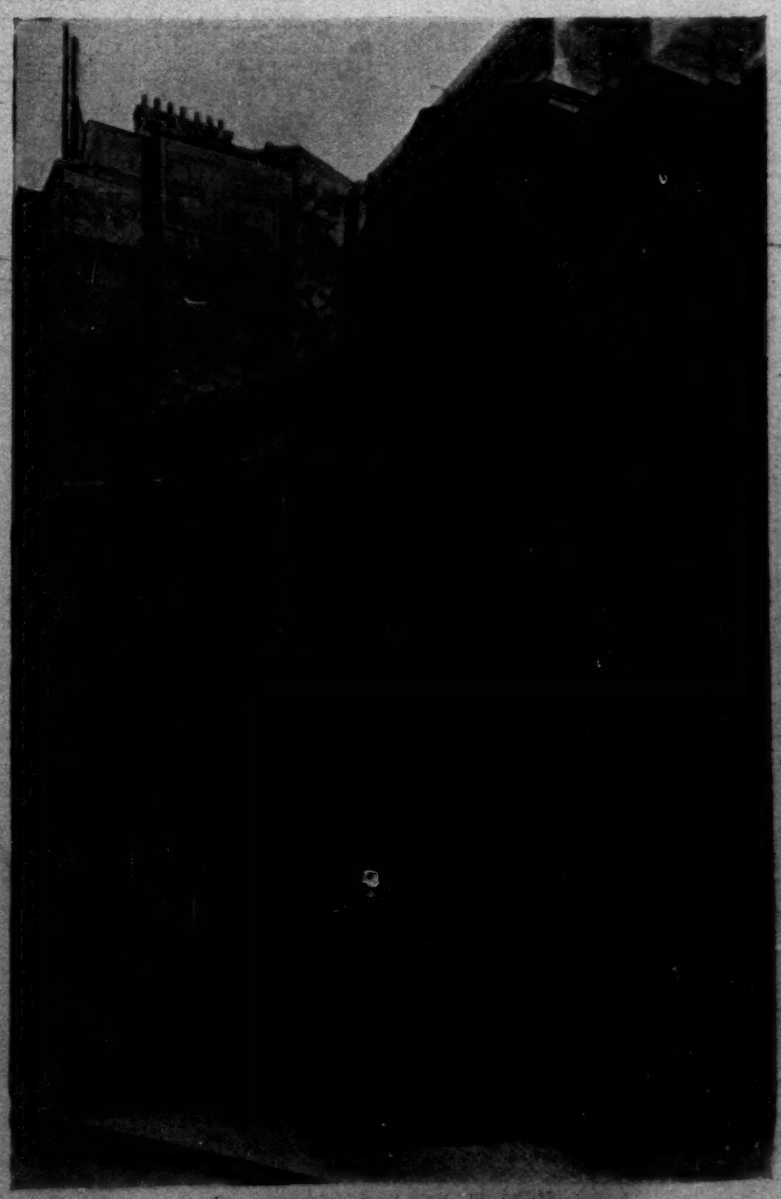


Paris: Fontaine de Grenelle. By E. Bouchardon (1739).

BUREAUCRACY *VERSUS* COMPETITION.

THE Aberdeen Education Committee, with a view to obtaining the best design for their new buildings, proposed to hold a limited competition between eight architects, but, having already had plans prepared showing the accommodation required, they, on submitting their proposal to the Scottish Education Department, received the following reply:—

"Scotch Education Department,
September 2, 1911.

SIR,—Adverting to your letter of the 23rd ultimo, I am directed to state that if, as the Department understand from previous correspondence, your Committee have already in their possession plans which are of such a character as to make it certain that their author would do the whole work adequately and satisfactorily in the event of its being entrusted to him, then the Department could not sanction the contemplated competition. It appears to them that it would be altogether unjustifiable, particularly in the present state of the Education (Scotland) Fund, to approve the expenditure of more than 1,000*l.* of public money on purposes that were not strictly necessary. They cannot think that such a course would be followed in the conduct of any private business concern.—I am, etc.,

G. W. ALEXANDER."

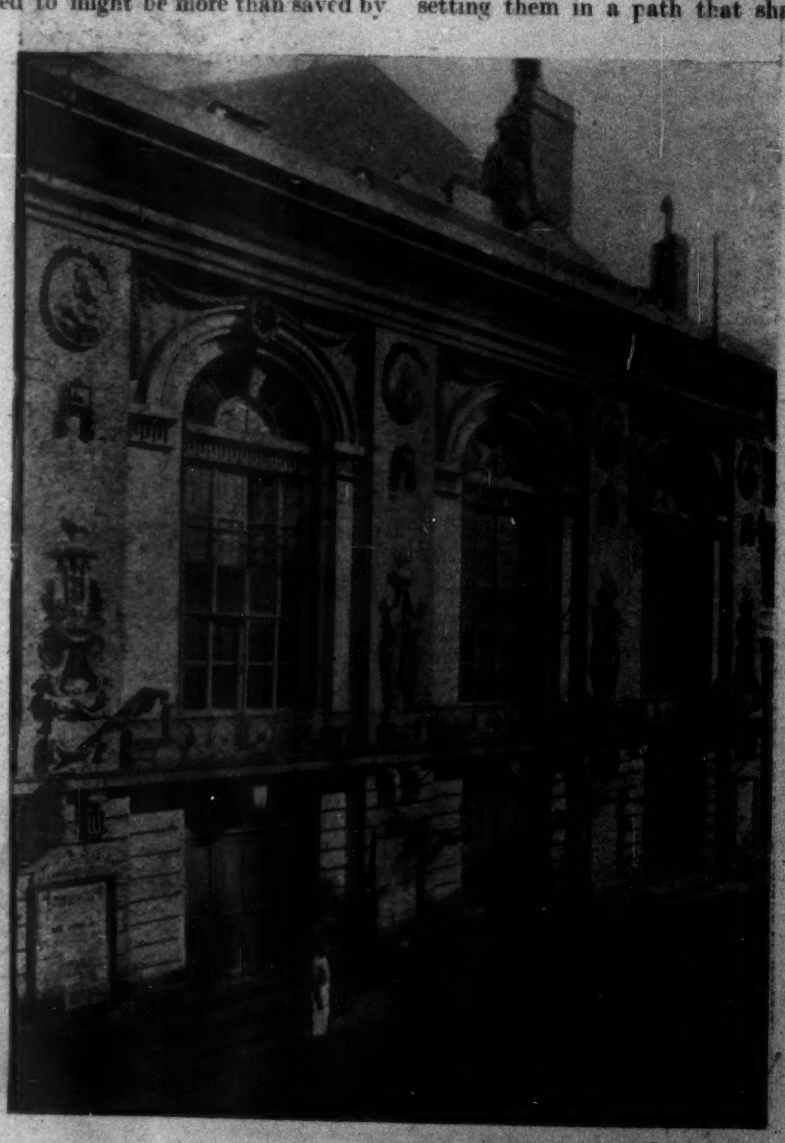
It is perhaps more to be deplored than wondered at if a public body discourages the advantages to be gained by obtaining competitive designs. To put the matter in the lowest basis of mere economy, it is easy to conceive that the 1,000*l.* referred to might be more than saved by improvements in arrangement that the best of eight designs would be expected to show, so that the idea of extravagance is short-sighted and fallacious.

We are, however, in official work, gradually coming more and more under the domination of bureaucratic methods that make for stereotyped design, and must necessarily discourage all proposals tending to promote experiment and innovations, without which, what hope is there of improvement and progress?

Human nature being what it is, how can the permanent official have the same incentive to modify and to improve which open competition among unfettered minds automatically gives? and the whole tendency of our governing bodies seems to be towards substituting the work of the permanent official for the independent practitioner. We hold no brief against the qualified official; he has much important work to do, and may do it exceedingly well, but we would take the opportunity of protesting against the growing tendency to throw all the work involving design and invention into his hands, as tending to stifle progress and lose to the public the advantages of unfettered minds working on problems ever developing.

The policy of government includes not only the immediate needs of the community as a whole, but their future advancement, and this entails provision being made for the encouragement of the more active and intelligent and for setting them in a path that shall keep this activity and intelligence at its full tension. Now, the system of increasing the number of officials has an effect the reverse of this, while that of open competition for work, whenever possible, fosters it. Therefore the right policy for those controlling public interests should be to limit their official staff to the actual strength demanded by the routine work and place as much of their work as possible in the open market, in order that they may be in a position to take advantage of every new idea and encourage those on whose ability our future depends.

We have referred to this question before, and shall probably have occasion to revert to it again, as the direction in which we are travelling appears likely to lead to national disaster. For us, who as a nation are already ultra-conservative in regard to ideas, to accentuate this by discouraging initiative is likely to prove fatal to our future welfare, and this course is exactly the one now being taken by our public authorities.



Theatre at Amiens. By J. Rousseau (1778-1780).
From Mr. W. H. Ward's "The Architecture of the Renaissance in France." (B. T. Batsford.)

NOTES.

The City Corporation at Vienna.

ALL those who cherish the imperishable memory of the lavish and graceful hospitality extended by the Court and City of Vienna to the International Congress of Architects, will realise that the Lord Mayor and Corporation of London are indeed fortunate in being the recipients of so warm-hearted a welcome from one of the most charming of European capitals. Apart from the value of such visits as promoting the cause of international goodwill and the general progress of humanity, they have a special value for the somewhat insular Englishman, and to no class of the community are their educational advantages more valuable than to those who undertake the responsibility for the government of our great cities, and for the control of their amenities—our civic authorities are not unconscious of this responsibility. They undertake it with a conscientious regard for honest government and the material interests of the city. But there is such a thing as an artistic conscience as well as a moral one; a sense of right and wrong in dealing with artistic questions as well as with commercial ones. It is this sense that is lacking here, and we know no better way of acquiring it than by sympathetic intercourse with the inhabitants of the great cities of other nations where the artistic conscience is a national possession. Would that this visit had taken place before the scheme for St. Paul's Bridge was finally settled. Possibly it might have led to a stirring of conscience. However, it is not too late yet: there is always time for repentance even at the eleventh hour. The bridge is not yet built.

State Aid for Housing Schemes.

MR. ARTHUR GRIFFITH-BOSCAWEN, writing in the *Times* of September 12, advocates that the State should provide half the net cost of clearing insanitary areas in our cities, and justifies his contention by the claim that improvements of this character have just

as great a claim on the State as others to which the national funds are already contributing. As a matter of principle we can hardly see the justification for such a claim. A State contribution ought only to be sought in cases affecting the community as a whole, and the detrimental influence of the slum is as definitely local in character as almost anything one could name. It appears manifestly unfair to tax a community that might have, through far-sighted and skilful local government, checked the development of slum areas for the advantage of one that had proved itself neglectful and slack. It is all very well to regard the State as a milch cow of unlimited capacity, but such an attitude tends to weaken the sense of local responsibility and to produce a condition of affairs that would result in a careless disregard of ways and means. In shifting the burden laid on our great cities for the improvement of the conditions of life in them, on whom would it fall? Either on other cities which have their own problems to cope with, and, as we have said, should not be penalised if they have dealt with them more effectually, or else on rural areas which are poorer and could ill afford to contribute to the cost of civic improvements.

The Tattershall Mantelpieces.

At the moment when we were congratulating ourselves on the fact that, through the public-spirited action of Sir Francis Trippel, Tattershall Castle and its mantelpieces were saved to the nation, comes the disconcerting intelligence that three at least of these mantelpieces have been so badly damaged by removal that the possibility of their restoration is in doubt. It might have been thought that those responsible for this destruction would at least have had the common sense to satisfy themselves that removal was practicable, and, if so, to ensure that it should be done in such a manner as to enable the product of their misguided efforts to be of a character suitable for reconstruction, otherwise of what value were their labours? According to Canon Rawnsley, even these precautions seem to have been neglected, and it appears as if the loss is irreparable. The expert who has investigated the condition of the fragments declares that even if restored the mantelpieces can never be what they were. The National Trust has decided not to proceed further in the matter, and it seems certain that Tattershall Castle will be denuded finally of its attributes, in a way which is nothing short of scandalous. It is clearly the duty of the nation immediately to take such steps as will render impossible the repetition of vandalisms of this kind. Mr. Leonard Stokes, in a letter to the *Times*, promises that the R.I.B.A. will support any movement for the protection of such buildings from injury.

The Abuses of Advertising.

Lovers of our country scenery will welcome the step taken by the Hampshire County Council under the Regulation of Advertisements Act, 1907, as recently announced by Mr. Richardson Evans, the Chairman of the "Scapa" Society, an association which secured the passing of the above Act, and which has done valuable service in protecting scenery. The provisions of the Act enable local authorities to make by-laws for "regulating, restricting, or preventing the exhibition of advertisements in such places and in such manner or by such means as to affect injuriously the amenities of a public park or pleasure promenade, or to disfigure the natural beauties of a landscape." There has been great difficulty in giving practical effect to the latter words of the sub-section because the Home Office held that to make a by-law operative specific places or spots must be indicated. With such a limitation it has appeared impossible to protect in general terms the amenities of our roadsides. The Hampshire County Council have now drawn up the following by-law, and have undertaken to defend its validity in the courts if it be called in question:—"No advertisements shall be exhibited on any hoarding, stand, or other erection visible from any public highway (whether carriageway, highway, or footway), and so placed as to disfigure the natural beauty of the landscape." It may be well to explain that the above by-law will in no way affect notices necessary for the business purposes of those actually occupying land or buildings. Common sense will support the above by-law, and it is to be hoped that no legal flaw will be discovered in its terms.

Taxation of Posters No Deterrent.

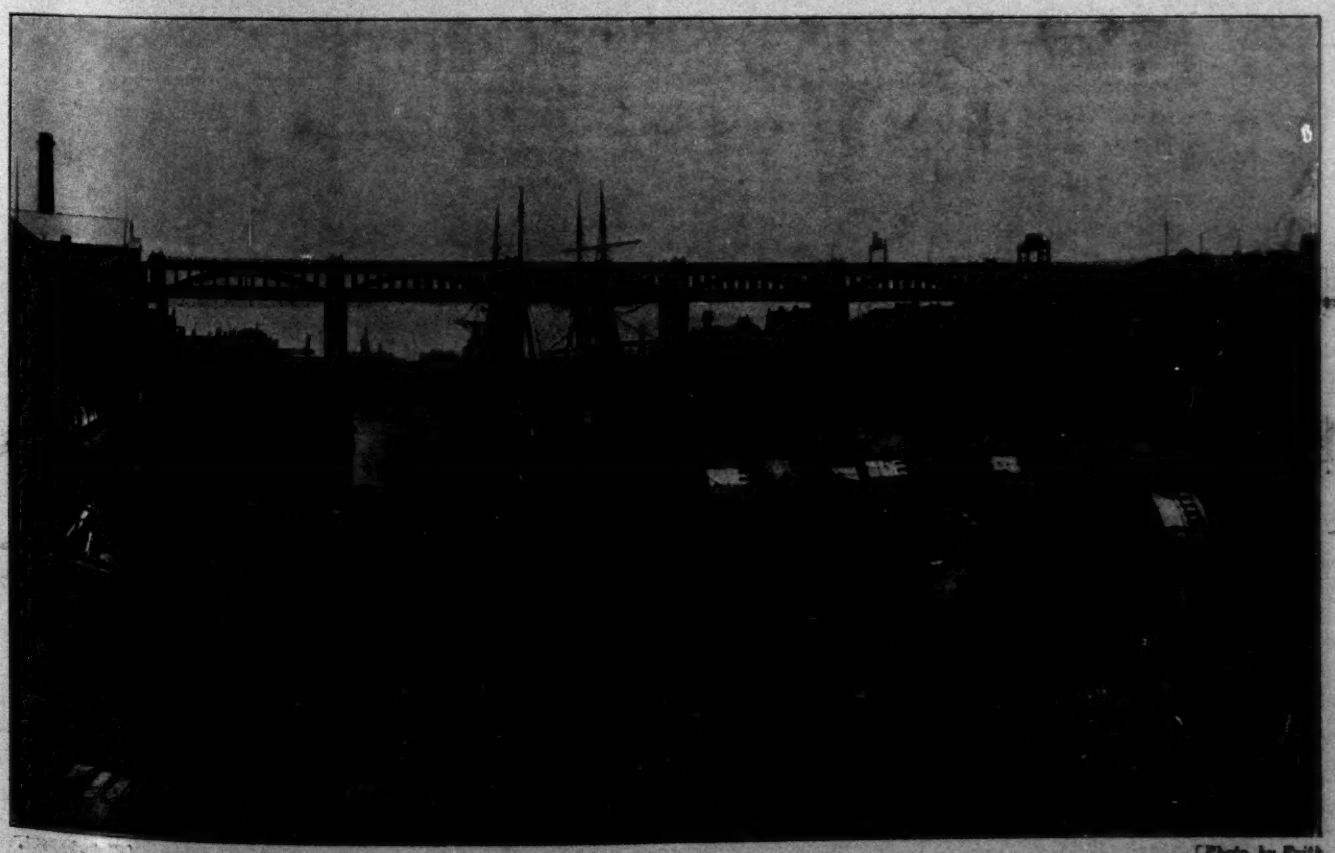
Whilst adverting to this subject we may observe that it has been often suggested that a tax might well be imposed on poster advertisements. In France some considerable revenue is derived from this source, but, far from appearing to check this form of advertising, we find the scenery in France more disfigured than our own by this barbarous method of advertising, and in such "beauty spots" as the Riviera the local authorities are much exercised by the question of checking the abuse. The taxing of such advertisements only appears to give official sanction to their use.

THE STORY OF THE BRIDGE.

By Walter Shaw Sparrow.

VII.—HINTS ON THE STUDY OF BRIDGE DECORATION.

M. Charles Béranger, of the Librairie Polytechnique, Paris, has begun to publish a series of full and thorough books on bridge-building, as useful to us as to French



[Photo. by Frith.

High Level Bridge at Newcastle: Early Victorian.

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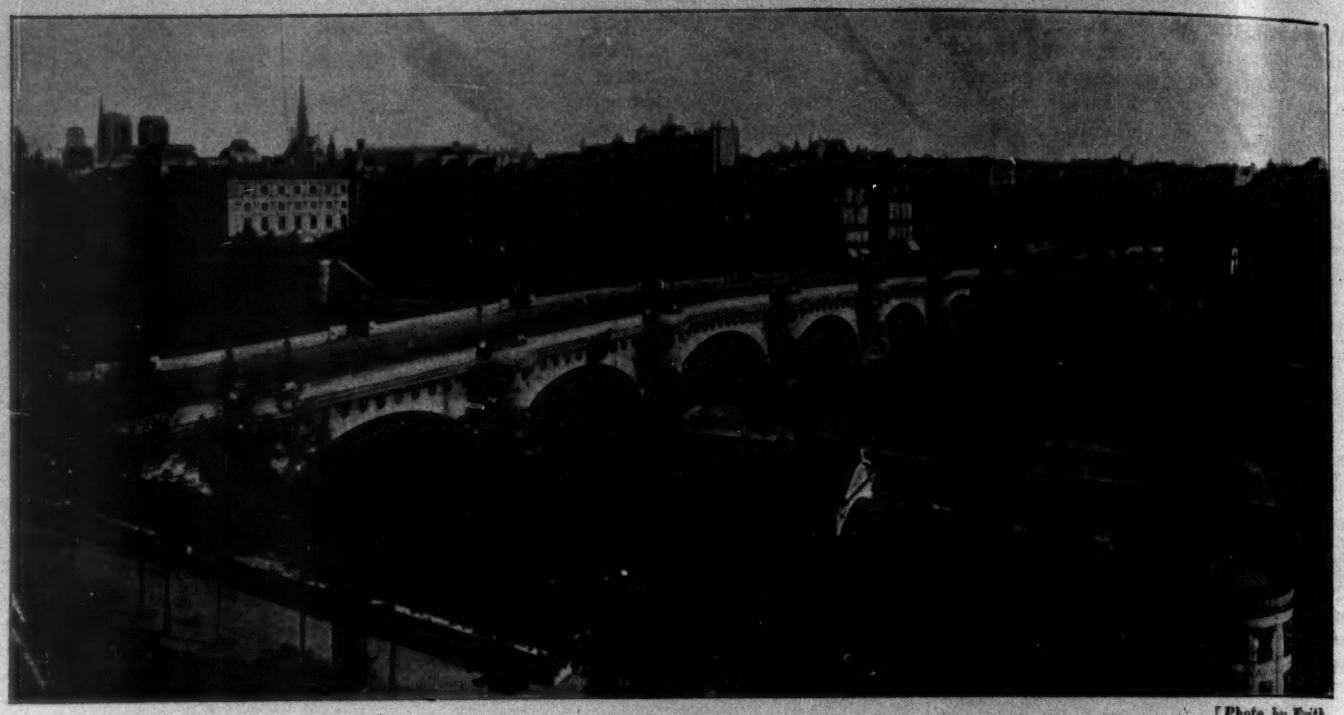


[Photo. by Frith.

The Pont Neuf, Paris.

students. Already eight volumes have been issued. They include:—

1. "Ponts en Maçonnerie." Par E. Degrand, Inspecteur-Général des Ponts et Chaussées, et Jean Résal, Ingénieur des Ponts et Chaussées. Two volumes, illustrated; 40 francs.

2. "Ponts Métalliques." Par M. Pascal, Ingénieur. One volume; 15 francs. Illustrated.

3. "Croquis de Ponts Métalliques." Par Jules Gaudard, Ingénieur Civil et Professeur Honoraire de L'Université de Lausanne. Profusely illustrated; 20 francs.

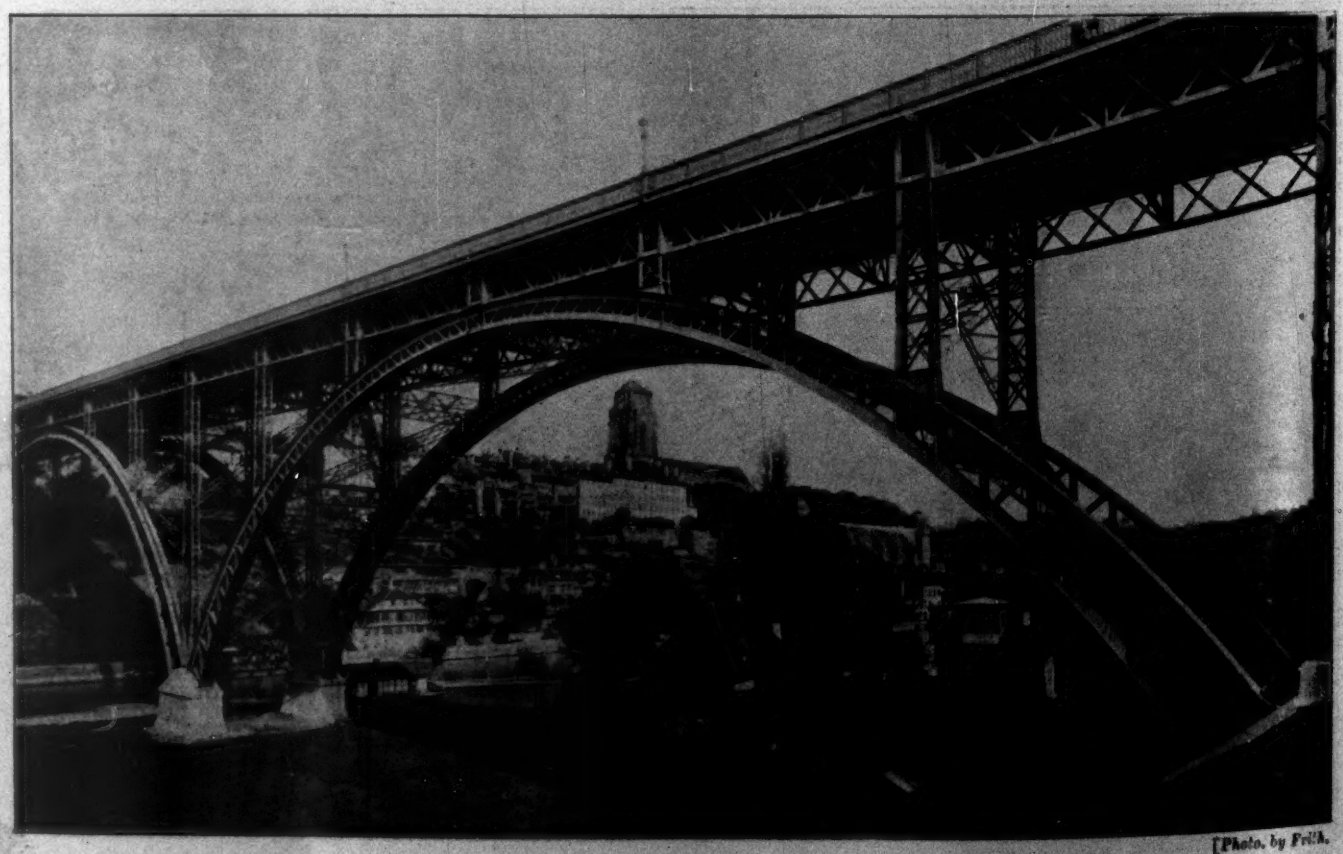
4. "Cours de Ponts Métalliques." Par Jean Résal. Tome i., 375 illustrations; 20 francs.

5. "Manuel Théorique et Pratique du Constructeur en Ciment Armé." Par MM. N. de Tédesco et V. Forestier. One volume, 242 illustrations; 20 francs.

6. "Etudes sur Les Ponts en Pierre Remarquables par Leur Décoration." Par F. De Dartein, Inspecteur-Général des Ponts et Chaussées en Retraite, etc. Vol. i., Ponts Français antérieurs au xix. siècle; not yet published. Vol. ii., Ponts Français du xviii. siècle; Centre; published. Vol. iii., Ponts Français du xviii. siècle; Languedoc; published. Vol. iv., Ponts Français du xviii. siècle; Bourgogne; published. Vol. v., Ponts Etrangers antérieurs au xix. siècle: Italiens, Espagnols et Anglais; 25 francs the volume; not yet published.

For this great work, to be completed in five abundant parts, M. De Dartein has made exact measured drawings from sixty-eight bridges, and each example represents a well-chosen type having great historic interest. The author has taken a line of his own, dwelling on the ornament of bridges, their decoration, and from his earnest study of the XVIIIth century we learn what he admires in one varied phase of French design. He is thoughtful and thorough, but I wish some photographs had been added to the illustrations, because measured drawings give only the dry bones of constructed work.

How to decorate a bridge is a question beset with so many practical difficulties and so many artistic problems that it ought to be discussed by a congress of architects and engineers. I cannot think that M. De Dartein will say the last word on this important theme, but his material and his personal taste will be invaluable, presenting facts and provoking discussion. He lingers often enough over details of ornament, which, so they seem to me, are superfluities in a bridge, because they swell the cost of production without any real benefit to the mingled utility and dignity needful in bridges.



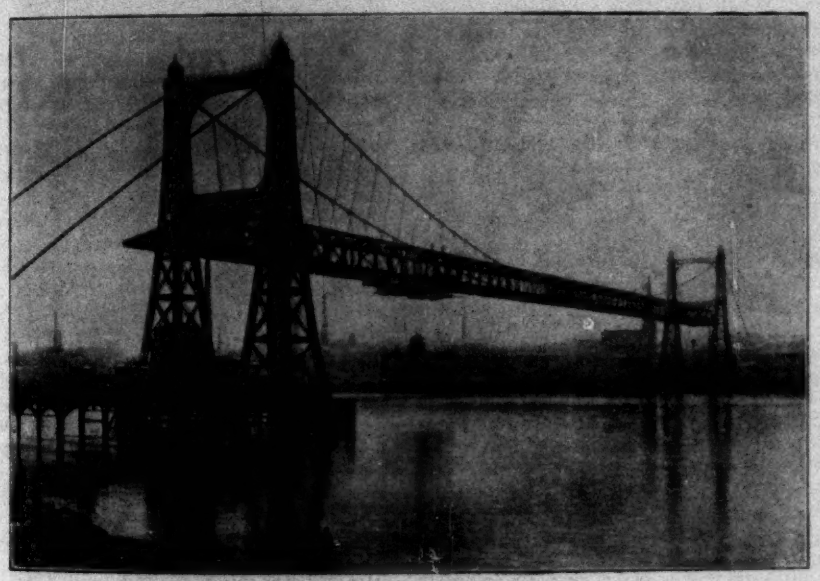
[Photo. by Frith.

Kirchenfeldbrücke, Berne.

Bridge at Budapest.

These qualities should appeal to us in great stern lines, in rhythmic proportions, and in a scale that befits the surroundings. No bridge can be fine and beautiful when it is dwarfed by its environment or when its own bulk is so massive and uncouth that it degrades a neighbourhood. Many engineers do not grasp the truth of this criticism, for their metal monsters are often as wrongly placed in a quiet and gentle landscape as a giant from Brobdingnag would be at Lilliput. The Roman bridge at Alcantara is noble and heroic just because the scale of it is in grand accord with the rocky vale of the Tagus. It completes a grand site, and finds its own completion in that site. This happened also in the Roman bridge at Narni, by which two mountains were linked together across the River Nova.

I have spoken of this bridge in an earlier article, but may add that in the existing remains, consisting of a pier and a fine arch, there is no applied decoration. The main thing to be noted is the powerful ring of voussoirs, because, extradossed in a very remarkable manner, it is independent from the spandrils. A bridge with arches of that type has architectural character, and this quality is obtained by designing arches for



Widnes and Runcorn Transporter Bridge.

a special purpose, i.e., to save them as much as possible from the vibration of heavy traffic sent down from the roadway through the spandrils.

Still, it cannot be said that all fine Roman bridges were free from redundant ornament. Pomp and pride exerted a bad influence at times; and from the Roman genius later ages borrowed numerous superfluities that weakened the aspect of bridges in many countries. It is in such Roman work as the Pont du Gard, where no detail is called for, and where the architect's aim was to meet nobly the needs of a well-considered programme, that we realise the futility of adding to a bridge any detail that neither springs from nor calls attention to some organic essential. To construct ornament is easy—is, indeed, a commonplace of bad taste, while to ornament construction is difficult, because judgment tells us that a great design carried out in simple and thorough masonry is in itself ornamental and complete. Applied decoration may harm it, just as a human face is disfigured by sticking-plaster.

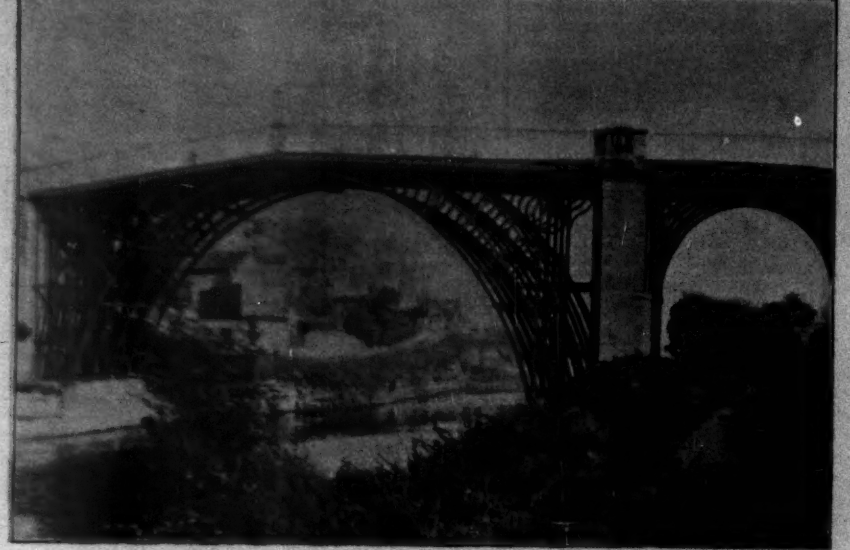
Consider, too, the bridge-builder's own attitude towards his art, for upon that more than anything else the character of his work depends. What has he got nowadays as an inspiration? He has all the self-consciousness that modern life produces and increases; he has also as a dictating guide the industrial spirit, with its delight in cheapness and its tolerance for hideous designs; and so, if he in his duties as an engineer is to produce art, he must achieve that good thing by deliberate effort and without help from his employers. Every now and again, by rare good fortune, an engineer builds a bridge having some rude grace of its own, some quality that seems a near neighbour to art itself. Thus the Menai Bridge does not spoil a glorious landscape, unlike the Britannia, a monstrosity that cost 398*l.* per foot run. From one point of view the Menai Bridge is bad, and we return to an important subject when we note that suspension bridges are so vulnerable as to be unfit public servants in a time of war. They represent a sort of aviation in mechanics, which modern artillery would soon destroy. Any such bridge as the Pont de La Caille on the route between Geneva and Annecy, or the steel suspension over Niagara Gorge, would have little value as a road if even one shell struck the permanent way, so called.

This consideration is one among many that we have to weigh carefully when we wish to look at bridges in their relation to life and art. M. De Dartein, I believe, lingering over decorative features, loses count of the plain fact that bridges ought to show in their construction some fitness for their great work as essential agents in military tactics and strategy. At a time when a secret society of bridge-wreckers, guided and disciplined by a military power, could do incalculable damage to railways and other roads at the outbreak of hostilities, having previously sent two thousand men with explosives into the country to be attacked; at such a time, surely, bridges should not be studied because of their ornamentation. All spies and secret agents could be bridge-wreckers also, and a good many of them may be, for we cannot suppose that strategists on the Continent are blind to the demoralisation that would seize upon an enemy if at the beginning of a war the business of concentrating troops to resist invasion were seriously impeded by shattered railway bridges. Are you not amazed, therefore, that the utility for war in mediæval bridges became a lapsed principle, when it ought to have been handed on to our time in a series of adaptations responsive to new conditions? For this principle in bridges, as in battleships, is certainly susceptible of progressive readaptations, if science and art do their duty well.

So my views on the decorative aspect of bridges, like those on other questions belonging to my subject, have for their aim the realisation of what a bridge should be in an age that prepares for war. I am not moved by those types of modern bridge-building that crib from civic architecture, displaying columns, pilasters, niches,

[Photo. by C. S. Sargisson.

Clifton Suspension Bridge.



[Photo. by C. B. Saryisson.

The First Cast-Iron Bridge (about 1780), Coalbrookdale, Severn Valley.

battlements, balustrades, turrets, and towers, pinnacles, statues along parapets, and statues above the cut-waters of piers, with other finery that serves no purpose in the essential life of a contemporary bridge. What Hoskings said in 1842 is good as a criticism to-day. He pointed out that the most eminent engineer-architects, in their efforts to take hints from street buildings, had failed to produce anything but meanness and absurdity, or a combination of both.

What this critic would have said had he lived to see the Tower Bridge, with its spurious mediævalism and its biscuit-like aspect, I cannot imagine. Hosking had common sense, and he seems to have been allied with a bad temper. Among the principles that he advocated strenuously I should like to note three :—

1. That bridges, in the combination of their leading lines, should be bold and simple ;

2. That infinite care and skill should try to make their passage across dangerous places a secure and safe highway ; and

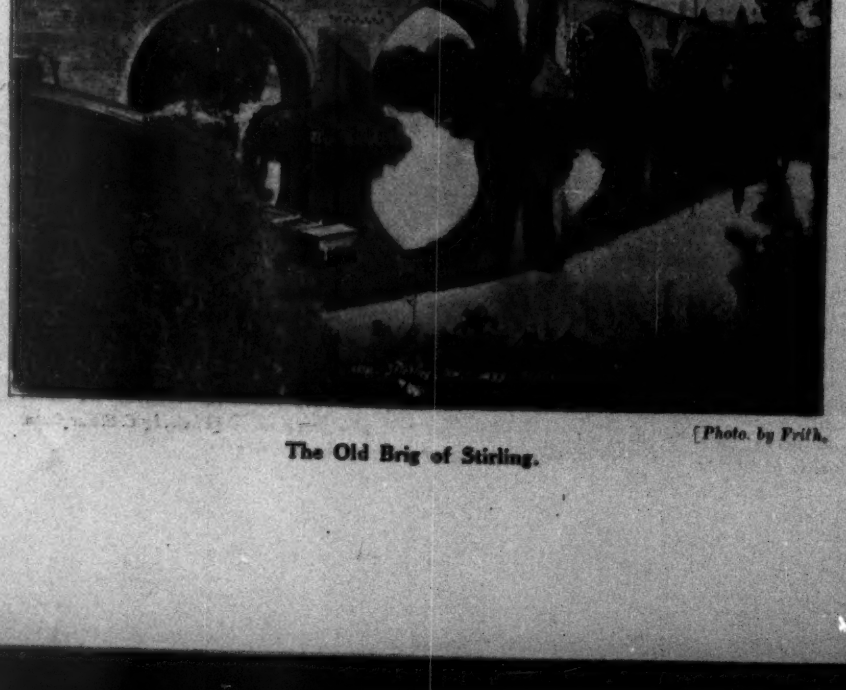
3. That far too much money is wasted in stone bridges on the high finish of exterior surfaces. Hosking was disinclined to regard great city bridges as probable exceptions to this rule, for he said :—"It may be fairly questioned whether both Waterloo and London Bridges would not have been finer objects had the masonry of their external faces been merely rough-axed, or even left scabbled, instead of being fair hammer-dressed ; and certainly many thousands of pounds might have been saved in the execution of the former work, and a much better result produced, by the omission of the coupled columns and their immediate accessories, and by the use of a plain parapet of a more reasonable height, instead of the high, the enormously expensive, and absurdly ugly balustraded enclosures which now aid the columns and their projected entablatures to deform that splendid structure."

This Puritan outlook appeals to me, for I believe that good bridges should be as sternly efficient, as indomitably fit for their purpose, as were the Ironsides of Cromwell's army. Beauty in a bridge is a thing apart from any Cavalier-like finery of dressing ornament. It shows that the different members forming a bridge are co-ordinated with fine judgment, and that the build of each member is in nice accord with its own work and with the great office which the bridge as a whole has to fulfil daily under varying conditions of stress and strain, and in relation to its environment.

When the railway bridge at Ludgate-hill was finished there was a public outcry against its gaunt and shabby ugliness ; but as soon as some ornamental metalwork was fastened upon its sides the outcry ceased, as if such a trumpery makeshift could give merit to an imbecile design that disgraced the main road leading to St. Paul's Cathedral. When things of this kind are allowed to happen in the heart of a great city, who can have confidence in civic authorities ? What chance is there that new projects for bridges will be considered publicly and officially from the various standpoints determining their value in peace and in war ?

Some types of bridge-building stand apart from each other in abrupt contrast. The Tower Bridge, London, and the Roman bridge at Narni, Italy, are separated not by centuries only, but by a marked degeneration in the spirit of craftsmanship. What would be the use of those ornate towers if the suspended roadway connecting them with the banksides were cut by a shell or by explosives ? And what historic relation exists between the principle of metal suspension and the towers, whose corner turrets and tall pyramidal roofs seem like feeble echoes from the French Renaissance and its Gothic inheritance ? The Menai Bridge is better by far, and note that the cables rest on the summit of their supports, unlike the tubes of the Britannia Bridge, which pass through the towered piers about two-thirds up, so that we wonder how the masonry of the upper parts is upheld. This mistake had its original source in a misunderstanding of two things—first, that a column or a pier is meant to bear a weight placed on the top of it ; second, that bridge towers of old were neither decorations nor make-believes, but necessaries of mediæval town life and warfare. They were to defend the bridge and its service to citizens. Everything that made a mediæval bridge picturesque sprang from some public need. A chapel was there for pilgrims and other wayfarers, for instance, and the houses that lined Paris bridges, Old London Bridge, the Ponte Vecchio, and other examples remind us not only that shops on a crowded thoroughfare enriched tradesmen, but that, land in walled cities being circumscribed, it was frugal to make use of bridges as building sites. The distant past knew how to use with judgment its own opportunities, while bridge-builders of recent times and of to-day are apt to produce work that is not constructive art in complete accord with current needs and conditions. The Tower Bridge is a typical affectation.

Note the difference in spirit between it and the Old Brig of Stirling, that we must place among the best bridges of its period. Its design has a fine rhythm, its round arches are admirably handled, and the simple masonry has vigour and grace. I give, too, by way of contrast, a photograph of the first metal bridge, dating from about the year 1780. At an earlier date, in France, an attempt was made to erect a bridge of cast-iron, but the project was given up as too costly. This occurred at Lyons in 1755. Then an English ironmaster, Abraham Darby, became possessed by the same idea, and he made use of it with practical success in the Severn valley, hard by the town of Ironbridge. Cast-iron was chosen, in ribs consisting of two pieces ; and a bold design proved that a new principle could be adapted with grace and efficient skill to the historic tradition of semicircular arches. This bridge still exists. It crosses the Severn in a span of 100 ft. 6 in * ; its roadway shelves a little ; and perhaps we find in this original work a clue towards the solution of that pressing problem as to the type best suited for a war bridge under present-day conditions. For arches of this kind, strong enough to bear traffic and railways across rivers, might be designed with such abutment piers as would not obstruct the waterway too much. The New Bridge at Mayence belongs to this type. For the rest, the width of arches in a war bridge would be determined by the reasonable degree of ease with which a broken span could be repaired after being cut by a shell ; or, if not repaired, made temporarily efficient for light traffic. But it seems certain that a war bridge in any strategical position should have an "understudy"—that is to say, a bridge similar to itself, but at some little distance from it, and having a branch road or line to connect it with the main line or highway. Usual hazards of war, we may suppose, would not be likely to breach both bridges at the same time.



[Photo. by Frith.

The Old Brig of Stirling.

* The total weight of ironwork in this bridge is 378½ tons.

GENERAL NEWS.

Professional Announcements.

Messrs. Newman & Newman, architects and surveyors, have removed their offices to St. Thomas' Chambers, 24, Railway-approach, London Bridge, S.E.

Mr. Dan. S. Williams, Civil Engineer, Cardiff, has been retained by the Town Council to report upon the drainage of the Borough of Llandovery, and to submit proposals for new schemes of sewerage and sewage disposal.

Junior Institution of Engineers.

Commendatore G. Marconi, D.Sc., LL.D., has been elected President of the Junior Institution of Engineers in succession to Sir J. J. Thomson, F.R.S.

Inspectors of Mines and Quarries.

The Home Secretary has framed a fresh scheme of examination for inspectors of mines and quarries. Candidates must be between twenty-three and thirty-five years of age; they must hold first-class certificates under the Coal Mines Regulation Act, and must within five years previously have been employed for two years as managers, or under-managers, of coal-mines, or in some other responsible capacities requiring regular attendance underground in coal mines; practical knowledge and experience of metalliferous mining and quarrying will also be taken into consideration. Nominations to compete will be given only by the Home Secretary upon the advice of a Departmental Committee of Selection, who will reject all testimonials and recommendations that are not based upon personal knowledge of the candidate's character and attainments. The scales of yearly salaries are for junior inspectors, 300*l.*-450*l.*; for senior inspectors, 500*l.*-700*l.*; for divisional inspectors, 750*l.*-1,000*l.*; and there are posts of chief inspector and electrical inspector. Applications for nomination to a forthcoming examination to fill several vacancies in the rank of junior inspectors should be made to the Private Secretary, Home Office, before October 15 next.

Liverpool University.

The prospectus of the School of Architecture of the University of Liverpool contains details of a new feature, namely, a certificate in architectural design. This certificate is designed to meet the case of students who wish to come to the School of Architecture for its special teaching in architectural design. Students, unless admitted by the Board of Studies on the ground of special qualifications, must have already obtained the certificate in architecture awarded by the University, or have satisfied the examiners of the Royal Institute of British Architects at the Intermediate standard, or have been exempted at that standard. Candidates for the certificate must have attended approved courses in the School of Architecture, (i.) during one day session, or (ii.) during the autumn and Lent terms of two evening sessions, and have satisfied the Board of Studies in not less than six designs to approved programmes. The examination will consist of a design made in the School of Architecture under approved conditions, for which at least five days shall be allowed. In other respects the Liverpool School of Architecture is alive to the possibilities of good training, and it will be found that under Professor Reilly, Professor Adshead, and the associated staff, the courses of study are fully considered in the interests of students.

The Polytechnic (Regent-street) School of Architecture.

We have received from the Regent-street Polytechnic particulars of the facilities offered in both day and evening courses of instruction for all following, or intending to follow, the many branches attached to the building trades and architectural profession. The Polytechnic has been rebuilt during the past twelve months at a cost of 90,000*l.*, and plans appeared in a recent issue of the *Builder*.*

The School is recognised by the Board of Architectural Education of the Royal Institute of British Architects, also H.M. Board of Education. The day department is under the control of Mr. G. A. Mitchell, A.R.I.B.A., who was appointed by the Governors of the Institute as architect for the rebuilding scheme. This day school is suitable for youths and young men who intend entering builders' and contractors' offices and works, and for those who wish to follow any of the many designing and constructive industries where an art, technical, and trade training constitute the best basis for future excellence and success. The evening department is intended for those preparing for the various professional examinations, also for the craftsman in the various building trades. Mr. Charles Mitchell, M.S.A., is the Headmaster. To prevent loss of instruction to any who may be unavoidably compelled to be absent from the classes, arrangements have been made this session whereby, for a reasonable number of times absent, upon application by the students, the classwork, together with the homework, will be sent by post. In addition, students are advised to attend the tutorial classes held every Thursday evening in connexion with the regular instruction. The object of these tutorial classes is to assist students in keeping up with the regular work of the session, and in overcoming any special individual difficulties.—A special course of twelve lectures on "Illumination" will be delivered at the Polytechnic under the supervision of Mr. Leon Gaster. Six lectures of the course will be delivered before Christmas on Tuesday evenings, commencing October 31, and the remaining six after Christmas on Thursday evenings, commencing January 11. The lectures, by specialists, will deal impartially with all illuminants, including recent advances in electric, gas, oil, and acetylene lighting; the effect of light on the eye; the hygienic aspects of illumination; the measurement of light and illumination, etc. Practical problems, such as the lighting of schools, streets, factories, etc., will also be treated in the second half of these lectures.

* June 16 last.

Birkbeck College.

The eighty-ninth session of the College will commence on Wednesday, September 27. The opening address will be given in the theatre, at 7.30 p.m., by Sir William Tilden, D.Sc., F.R.S. The classrooms, etc., will afterwards be open for inspection, and there will be an exhibition in the art school. Visitors are invited. The College is conducted in relation with the University of London; classes are held both in the day and evening; thirty members of the staff are recognised teachers of the University. The courses of study provide for degrees in the faculties of arts, science, laws, and economics. There is a very complete curriculum for chemistry, physics, mathematics, geology, etc. The laboratories are well equipped with modern apparatus and appliances, and research work is encouraged in all the science departments. The College possesses an art school, which provides instruction in the various branches of artistic work (painting, modelling, life, design, etc.).

Glasgow Improvements.

The City Improvements Trust recommend the Corporation to apply for statutory powers to borrow 100,000*l.* for the completion of buildings now being erected in High and Bell streets, and the reconstruction of the old Tontine and the old Town's Buildings, destroyed by fire on September 3-4 last. The Tontine, formerly the Exchange, was built, in 1782, on the north side of Trongate, at the Cross. The fire extended to the Tolbooth and the old Town Hall, as well as the warehouses and shops which mark the site of the former Jail and Courthouse described in "Rob Roy."

BOOKS.

The Ground Plan of the English Parish Church. By A. H. THOMPSON, M.A., F.S.A. (Cambridge University Press. 1s.)

THE Cambridge manuals have already established a high reputation. This volume is a distinct addition to the series, and we hope that there will be found enough people interested in the subject to make it a financial success. As the author says, there is no book entirely devoted to the development of the ground plan of the parish church.

The author knows his subject well, and has handled a somewhat technical subject with considerable skill. His deductions are sound and the plan of his book well arranged. The illustrations are, on the whole, good.

His description of the extension of a church in the Middle Ages is very interesting. The building had to be in constant use. When, therefore, aisles were added to an aisleless nave the aisle walls were built beyond those of the nave, the roof was added, and then the arches and pillars were gradually inserted in the nave walls. Finally, the stonework within the arches was removed, hence Norman walls resting on arches of a later period, and remains of blocked windows, doors, etc.

The author fails, however, to explain the reason for the appearance of the tower, though he doubtless realised it himself.

He is careful to show that towers came into use about the time of the Danish invasion. They were often added to older buildings which originally had none, as at Brixworth. Further, a type of church appeared of which the main feature was a large and strong tower, with but rudimentary nave and chancel. Barton-on-Humber is a typical example, the mediæval church to the east having taken the place of the small Saxon chancel.

This plan vanished in the XIth century. Surely the explanation is that the church, being the one permanent building, became the castle of refuge for the village from the raids of the Danes, and, as such, the tower was the strongest part. Here the villagers could take refuge and await in safety the advent of the relieving force—the levy of all the freemen of the shire—who could be summoned by bell and beacon.

It would be quite possible to bring forward a considerable amount of evidence in support of this view, but this is hardly the occasion for it.

The book is, therefore, valuable not only for the information it affords, but also for the interesting lines of thought to which it gives rise.

Building Construction and Drawing: A Text-Book on the Principles and Details of Modern Construction. By CHARLES F. MITCHELL, assisted by G. A. MITCHELL, A.R.I.B.A. Eighth Edition, revised and enlarged (eighty-second thousand), with about 1,100 illustrations, and 470 pages of text. (London: B. T. Batsford, High Holborn. Crown 8vo, cloth. Price 3s.)

IT is with pleasure we call attention to the new edition of this excellent book, previous editions of which have been noticed in our pages. The work is designed to meet the requirements of the Board of Education, the Royal Institute of British Architects, the Surveyors' Institution, and other examining bodies, and as an elementary book on the subjects with which it deals it is doubtful if a better work could be produced. The author is not only a well-known lecturer on building construction at the Regent-street Polytechnic, but he is the Headmaster of the Polytechnic Technical School, and having, as he doubtless has, an intimate acquaintance of the difficulties and needs of students, he is well qualified to compile this work in order to meet the requirements of the various examining bodies. In any case, he has written a book which is a model of clearness and conciseness, and which should be in the hands of every student engaged in building construction. The aim of the author has been to give, with conciseness and accuracy, a clear statement of the principles which should govern the execution of building work, and whilst taking due note of all recent advances of importance, to so correlate and illustrate the subject matter of the work as to render it equally valuable as a guide for the student taking examinations, and for the practical man engaged on building. On a perusal of this edition, it will be found to contain the subject matter of the preceding ones carefully revised throughout, together with many items not hitherto treated or specially emphasised. The work is an invaluable one, and we know of no reason why the present edition should not be followed by many others.

EDITORIAL SUMMARY.

The leading article deals with the Renaissance in France—a review of Mr. W. H. Ward's able work, just published, on "The Architecture of the Renaissance in France, 1495-1830."

A second article is entitled "Bureaucracy *versus* Competition" (p. 322).

Notes (p. 322) include: "The Abuses of Advertising"; "Taxation of Posters No Deterrent"; "The Tattershall Mantelpieces"; "The City Corporation at Vienna"; "State Aid for Housing."

"The Story of the Bridge," by Mr. Walter Shaw Sparrow, is continued this week in part VII., which gives hints on the study of bridge decoration. The article is illustrated (p. 323).

Book reviews (p. 327) include: "Building Construction and Drawing"; "The Ground Plan of the English Parish Church."

In our Correspondence Column (p. 328) will be found letters on "Ventilation" and "A Quaint Text-Book."

The Monthly Review of Engineering, illustrated (p. 331), contains: "Maverick Cotton Mills, Boston"; "Foundation Loads—I."; "Screw Pile at Victoria Pier, Fleetwood"; and Notes.

The Building Trade Section (p. 335) includes: "New York Bureau of Buildings, 1910"; "Old Materials on a Building Site"; "Boiler Explosions in 1910"; "Palmer's Travelling Cradles"; "Asphalt Supplies and Preparation"; "The Strikes and Employment"; "Projected New Buildings in the Provinces."

An article on the misuse of stone is given on p. 339, while on p. 342 are articles on: "Architecture and Sculpture at South Kensington" and "The Manor and the Building of Marylebone."

MEETINGS.

SATURDAY, SEPTEMBER 23.

Northern Architectural Association.—Visits to (1) Stella Hall, by permission of Mr. Jos. Cowen, (2) Axwell Park, by permission of Col. C. W. Napier-Clavering.

The Institution of Municipal and County Engineers.—A special general meeting at the Town Planning Exhibition, Gidea Park, Romford, Essex, for the purpose of considering and, if approved of, adopting resolutions as special resolutions as to alterations in the Memorandum and Articles of Association. 3 p.m.

MONDAY, SEPTEMBER 25.

Architectural Association.—Opening meeting of Session 1911-12 of the School of Architecture. (1) Exhibition of Students' Work. (2) Professor Beresford Pite on "Architectural Education." 6.15 p.m.

TUESDAY, SEPTEMBER 26.

Junior Institution of Engineers.—Visit the Electrical Exhibition at Olympia, under the guidance of members of the Committee. 6.30 p.m.

COMPETITION NEWS.

The Tea House at Southampton.

The Public Lands and Markets Committee of Southampton Town Council have had before them a letter from the architects for the Tea House on the Common stating that they found the same could not be erected for the sum of 500*l*., and that they had altered the specification to bring it within that amount. The Borough Engineer has been instructed to reply to the effect that the Committee could not recommend the Council to proceed any further in the matter owing to the modification of the design and the curtailment of the specification in the matter of construction, especially as such deviation and discrepancies had taken place without the knowledge of the Council. The Borough Engineer was also instructed to obtain the design second in merit and ascertain if it could be carried out for the amount stipulated.

Art Competitions, Stockholm, 1912.

Competitions in architecture, sculpture, painting, music, and literature will be held in connexion with the Olympic Games of Stockholm next year. Competitors should notify their intention to enter for one or more of the competitions before January 15, and send in their exhibits before March 1. Sculptors must submit clay models not exceeding 80 centimetres in any dimension. Applications should be addressed to Olympiska Spelen, Stockholm, or to M. le Président du Comité, International Olympique, 20, Rue Oudinot, Paris.

Cemetery Buildings, Newcastle-on-Tyne.

The award of Mr. Cross in the competition for a chapel, a house, and a cemetery wall in connexion with the new burial-ground at Newcastle-on-Tyne is as follows:—(1) Mr. Edward Cratney, of Wallsend; (2) Messrs. Oliver & Leeson, of Newcastle; (3) Mr. Scaife, of Whitley Bay.

The Berne Monument.

Signor Giuseppe Romagnoli, of Bologna, has been selected as the sculptor of the monument at Berne to celebrate the foundation of the International Telegraph Union.

BOOKS RECEIVED.

THE ARCHITECTURE OF THE RENAISSANCE IN FRANCE, 1495 TO 1830. In two volumes. By W. H. Ward, M.A., A.R.I.B.A. (London: B. T. Batsford. 30s. net.)

BUILDING CONSTRUCTION AND DRAWING. By Charles F. Mitchell, M.S.A. (London: B. T. Batsford. 3s.)

THE MAKING OF A GREAT CANADIAN RAILWAY. By F. A. Talbot. With illustrations and map. (London: Seeley, Service, & Co., Ltd. 16s. net.)

AN ANALYSIS OF THE CHURCH OF ST. MARY, CHOLSEY, IN THE COUNTY OF BERKSHIRE. By F. J. Cole, D.Sc. Oxon. (London: Henry Frowde. 5s. net.)

IN THE MARCH AND BORDERLAND OF WALES. By A. G. Bradley. Illustrated; in two volumes, viz.:—Glamorgan and Gower, 3s. 6d. net, and Shropshire, Herefordshire, and Monmouth, 5s. net. (London: Constable & Co.)

CORRESPONDENCE.

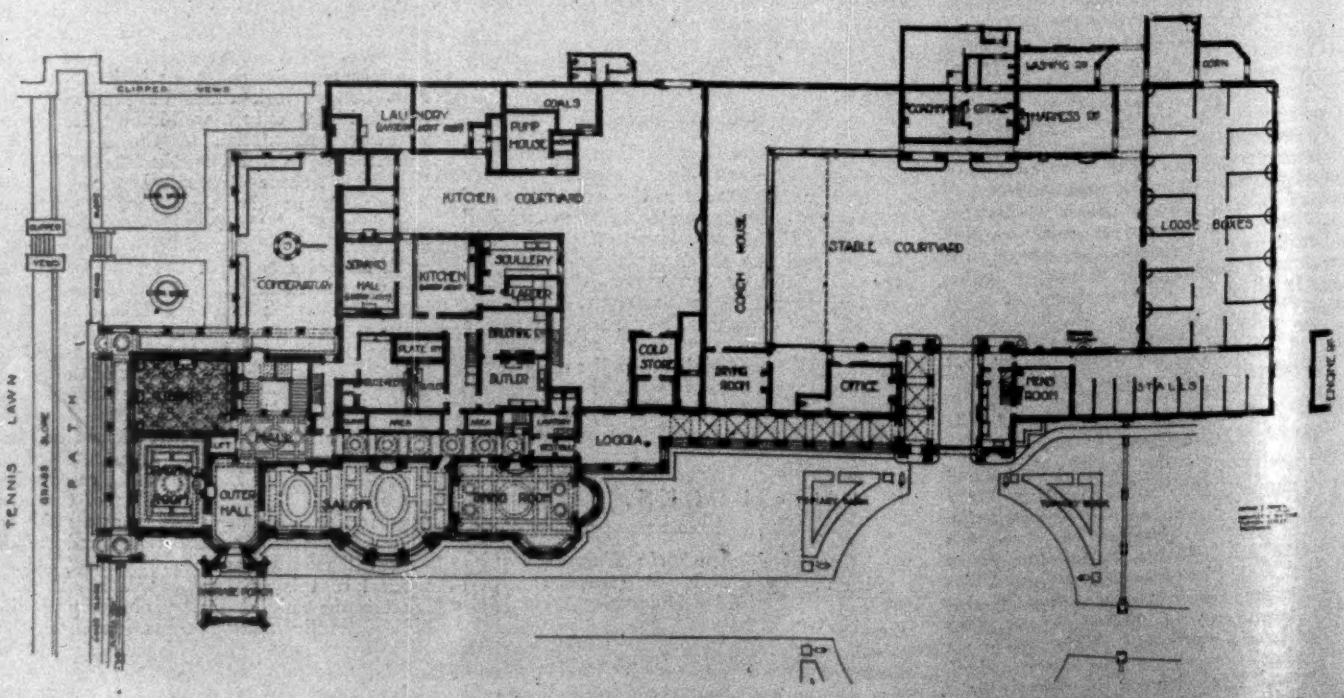
A Quaint Text-Book.

SIR,—From the extracts given in the *Builder* it is evident that the compilers of the "Quaint Text-Book of 1734" owed a greater debt to Sir Henry Wotton's "Elements of Architecture" than they seem to have acknowledged. It was there that the "political" caution first appeared not to build "too neere a great Neighbour," and it was from the same source that they learned the three conditions of well building—"Commoditie, Firmenes, and Delight." This *trinoda necessitas*, if I may so call it, has, however, a higher authority than Sir Henry Wotton, for it appears to be an adaptation of the well-known passage in Vitruvius, Lib. I, cap. II., beginning, "Architectura autem constat ex ordinatione, quæ græce rátis dicitur."

Wotton published "the Elements of Architecture" in 1624. Various opinions have been expressed upon it. Mr. Sidney Lee, in the "Dictionary of National Biography" applies to it the epithet "jejune"; on the other hand, Mr. J. A. Gotch, in "The Growth of the English House," speaks of it as "a sensible treatise." BENJAMIN WALKER.

Ventilation.

SIR,—You referred, in your last issue, to Mr. Leonard Hill's paper read to the members of the British Association. Those whose business it is to design ventilation schemes must bear the brunt of the adverse criticisms, but I think it should be more widely realised that, whereas nine people out of ten will



Sennowe Park, Norfolk.
Mr. G. J. Skipper, F.R.I.B.A., Architect.

agree that the principle of a "cool moving and dry atmosphere" is, at any rate, correct in theory, the difficulty is that the tenth man prefers just the opposite, and, when his comfort is affected, he makes his voice loudly heard.

The other and still greater difficulty is that the nine men, however much they may enjoy a breeze out of doors, will not endure the feeling of movement of air in a room.

The difficulties of the ventilating engineer would almost disappear if his client no longer required him "to provide ten changes of air per hour without perceptible movement."

S. WHITMORE ROBINSON.

INTERCOMMUNICATION COLUMN.

Fungus and Boarding.

SIR,—About twelve months ago I had to engage a builder to take up the whole of the boarding in my middle room, as the boards were eaten away by a kind of fungus. They were relaid again, but once more the same thing attacked the boards, making it necessary to take them out, as the wood was rotten. I then had the room covered with tiles. About a month ago I noticed that the same white-coloured fungus was making its appearance in the skirting and around the door frame, making it necessary to remove the skirting. There is a peculiar and nasty smell with the fungus, and it appears to make the boards quite rotten.

I have consulted a builder, who cannot understand what it is, and cannot suggest anything to remedy it.

My object in writing to you is to ask whether you can give me advice, as the growth seems to spread rapidly, and I am afraid that it will get into my front room boards.

The fungus is of a creamy colour, and has a very damp feeling when touched. There are no damp courses to the walls, but the strange part is that it attacks the walls on the inside of the house, and not the outside.

W. E. D.

ILLUSTRATIONS.

Design for the National Museum of Wales.

THE plans and elevation of this design by Messrs. Lanchester & Rickards were published in our issue of April 23, 1910. The drawing from which our plate is taken was exhibited in the Royal Academy this year.

Sennowe Park, Norfolk.

THE extensive enlargements and alterations which have been lately in progress to fit Sennowe Park, Norfolk, as a residence for Mr. T. A. Cook, are now completed.

The drawing reproduced on one of our plates shows the nature of the work on the east, or entrance, and the south fronts. The far right-hand object in the view is the entrance to the stable courtyard, and from this the arcade leading to a loggia under which is the north entrance to the hall itself. The composition and design of the hall were largely determined by the existing building, the retention of which was desired; hence the two octagonal turrets and the position of the carriage porch.

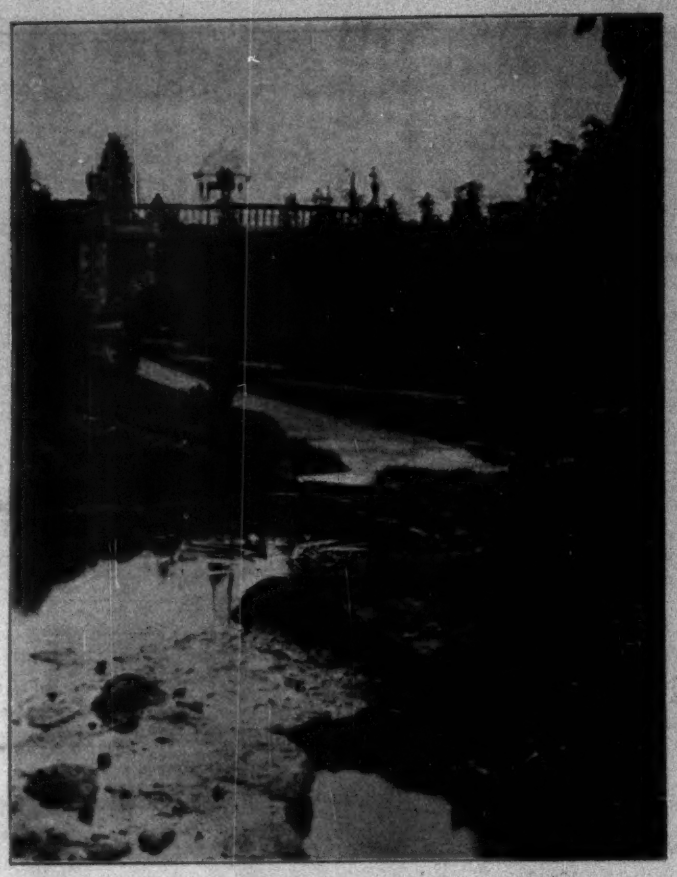
From the plan (p. 328) the scheme will be seen to embrace not only very large additions to the hall, but the complete range of stabling and coachhouses, motor garage, and electric power house, also an entirely new winter-garden, water and belfry tower, laundry, etc. Over and beyond these buildings the terrace gardens have been largely extended, and the entrance forecourt has been formed wholly anew. Virtually the gardens have been completely redesigned and enlarged by tennis and croquet courts, a rose-garden, and a water-garden. From the water-garden a pergola leads the pathway from the garden grounds to the rhododendron walk, running beside the trout stream, crossing it, and extending itself quite round the further, or south, side of a newly-formed lake of some 8 or 9 acres in extent. All the drives have been re-formed and new approaches made through the plantations to the hall connecting themselves up to the pine avenue, which leads from the hall, past the gamekeeper's cottage, to the new lodges known as the Ryburgh Gates.

In an opposite direction an entirely new avenue, some three-quarters of a mile in length and in width about 120 ft., with double lines of elms and grass galloping tracks on either side of the broad carriage road, leads from the park to the new lodges known as the Norwich Gates.

The main reception-rooms were finished off in oak and hard woods, and a saloon some

Sennowe Park, Norfolk: South Colonnade, showing Mr. H. C. Fehr's Figure, "Evening."
Mr. G. J. Skipper, F.R.I.B.A., Architect.

Sennowe Park, Norfolk: Coachman's Cottage.
Mr. G. J. Skipper, F.R.I.B.A., Architect.



Sennowe Park, Norfolk: The Water Garden.
Mr. G. J. Skipper, F.R.I.B.A., Architect.

55 ft. long was carried out in Italian walnut.

Mr. George Riches, of Cromer, was the general contractor for the work, whilst the whole of the stonework has been carried out by Mr. E. W. D. Potter, of Norwich.

The exterior stone carving has been executed by Messrs. Farmer & Brindley, of Westminster, including the figures on the attic of the entrance front and also a good deal of the interior wood-carving.

Mr. H. Fehr, of Fulham-road, London, has executed many figures in bronze and stone and also many sculptured animals and birds to decorate the different gardens.

The decorative mural paintings of figure and sporting subjects were partly the work of Mr. George Murray, of London, and partly from the brush of the late Mr. W. J. Neatby, of London.

An oak staircase, with carved scroll foliage and flowers, the surrounding walls enriched with moulded oak panelling, is a feature of the interior.

The stable fittings and heating were carried out by Messrs. Musgrave & Co., of Belfast and London.

The gates and other wrought-iron fittings were made by Messrs. Singer, of Frome, and by Messrs. Hardman, Powell, & Co., of Birmingham.

Messrs. Wm. Paul & Sons, of Waltham Cross, carried out the whole of the garden work, topiary work, and all the planting in the different clumps and enclosures in the grounds and park.

The formation of the lake, the terrace gardens, and the whole of the roadwork was carried out by Messrs. Mornement & Ray, of East Harling. Mr. A. W. Roy acted as clerk of works.

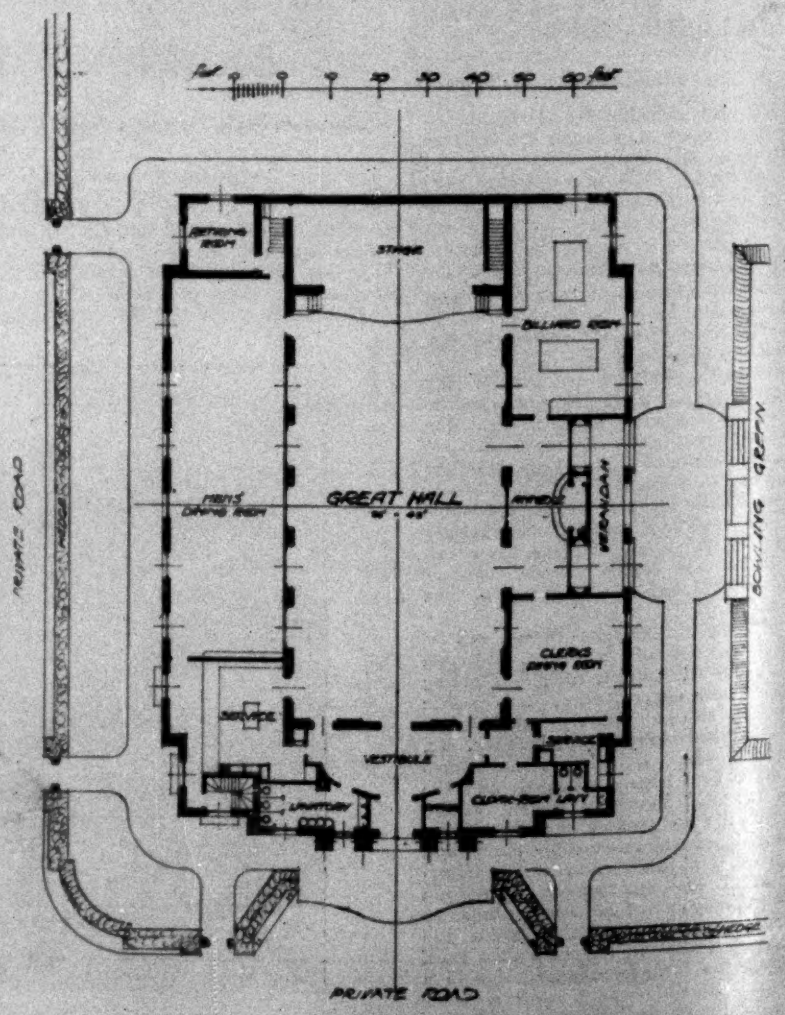
The whole of the undertaking, including the gardens and road works and also the interior decorations, was carried out from the designs of Mr. George J. Skipper, F.R.I.B.A., architect, of Norwich, with whom Mr. F. W. Skipper was in partnership at the time.

Recreation Hall, Southall.

THIS building has been erected at a cost of 11,000*l.* by Messrs. A. Marshall Mackenzie & Son for Messrs. Otto Monsted, Ltd., margarine manufacturers. It is well situated in front of the works at Southall, among trees, and overlooking bowling-green and tennis-lawns. The walls are finished in cement, painted white, and the roofs are covered with black Dutch tiles. The builders were Messrs. A. & B. Hanson, Southall.

The Story of the Bridge.

THE views of the Moselle Bridge, Coblenz, and the New Bridge, Mayence, are given in connexion with Mr. Shaw Sparrow's seventh article (p. 323).



Recreation Hall, Southall.
Messrs. A. Marshall Mackenzie, A.R.S.A., and A. G. R. Mackenzie, A.R.I.B.A., Architects.

FIFTY YEARS AGO.

From the *Builder* of September 21, 1861.

The Breakwater at Portland.

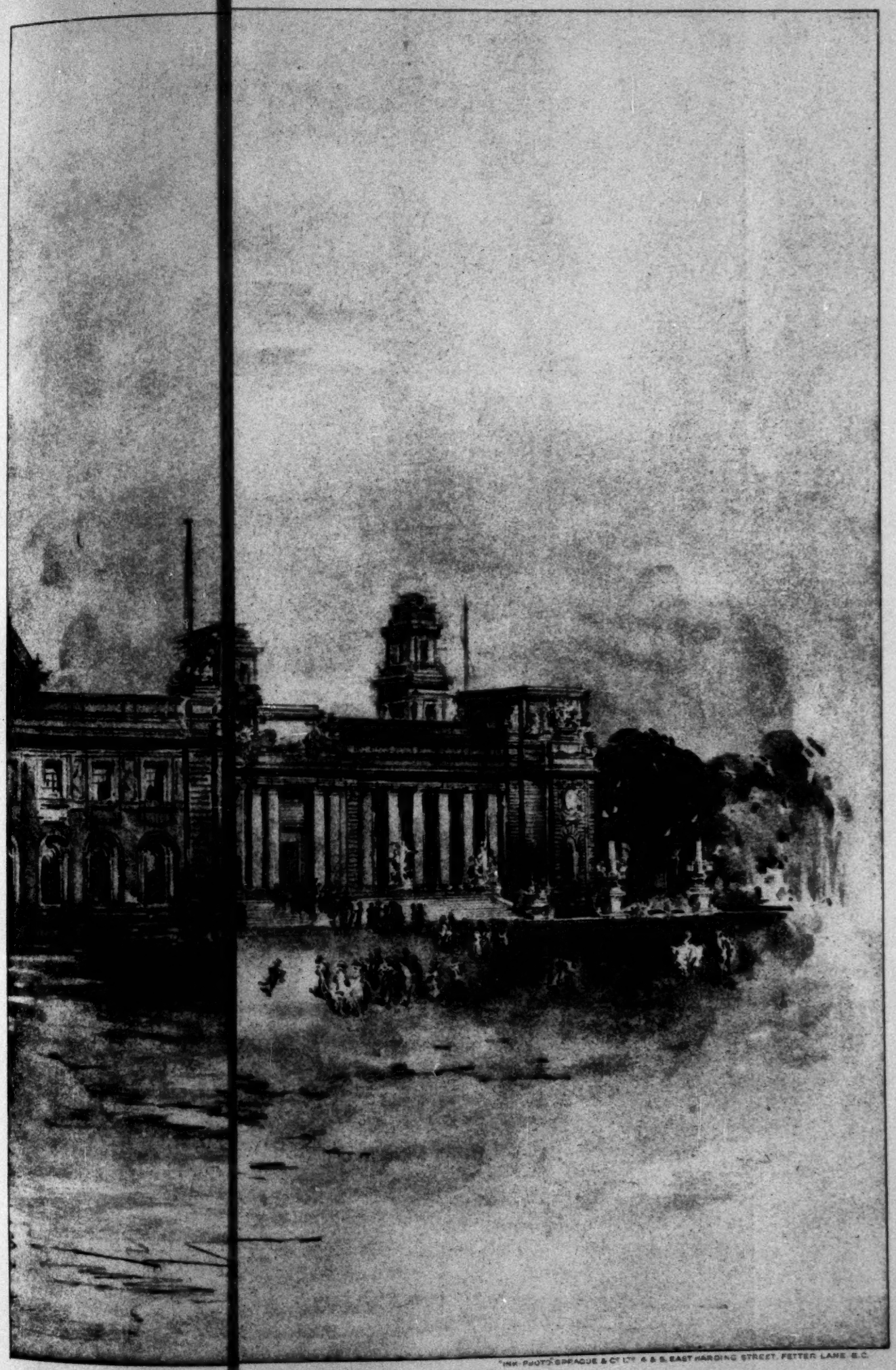
THE breakwater at Portland is finished, and the *Times* has given a warmly coloured account of the success which has been achieved. The writer says the shape of the breakwater is an obtuse angle, stretching from the island at first towards the north-east and then turning away due north into deep water, half across the splendid bay. Apparently, as one stands on the shore and looks along the interminable rows of black timbers peering up starkly out of the sharp long reef of white stones, there does not seem a great deal to show for nearly thirteen years of constant labour, for the fruits of all this toil are, of course, beneath the sea. If the restless waves wore away the visitor would behold a sort of ridgy mountain, or, at least, a hill of colossal stones, more than a mile and a half long, 100 ft. high, and 300 wide at its base.

PUBLIC WORKS LOAN COMMISSION.

The annual report of 1910-11 shows that the Commissioners have made advances to the aggregate of 3,860,301*l.*; whereof 311,443*l.* was advanced for the provision of dwellings for the working classes, the loans being secured upon property of the London Housing Society, Ltd., East End Dwellings Company, Hampstead Tenants, Ltd., and several kindred societies.

PAISLEY ABBEY.

The old houses in Gauze-street that have just been pulled down were constructed to a considerable extent of worked stone from the Abbey adjacent, which was founded in or about 1160 by Walter Stuart, ancestor of the royal house of Scotland. The carved and moulded stones have been carefully preserved for return to their original uses in the restoration of the Abbey.



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Royal Academy Exhibition, 1911. A. RICKARDS, F.R.I.B.A.

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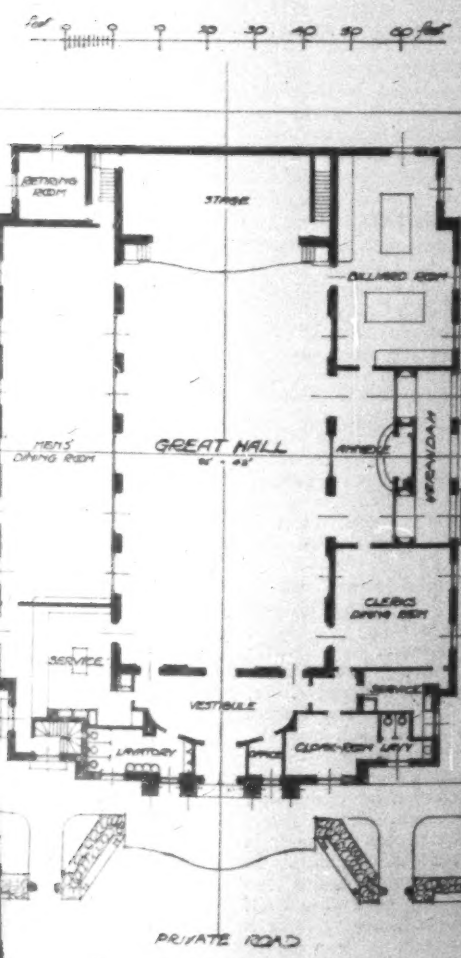


Recreation Hall, Southall.

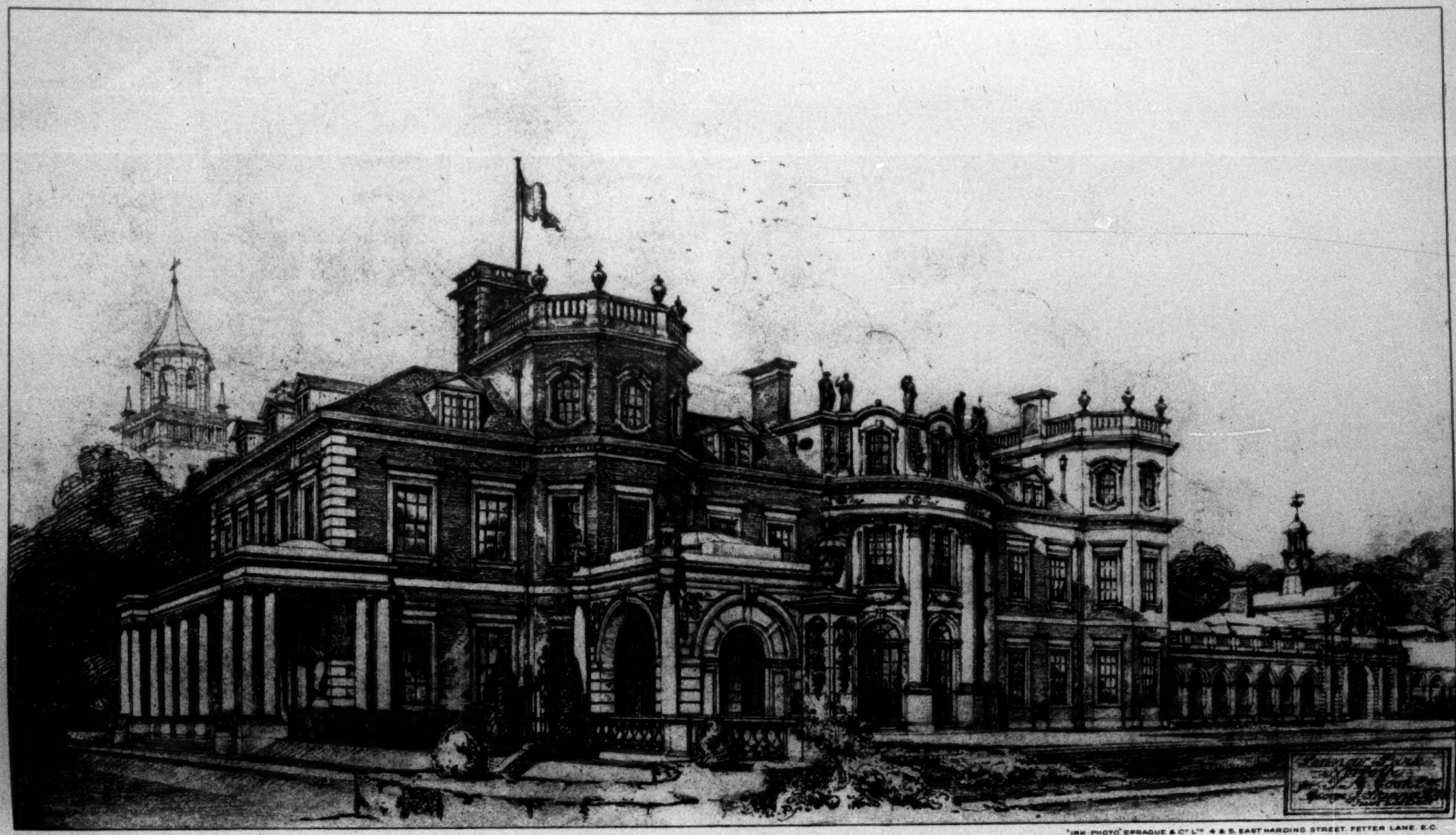
Mackenzie, A.R.S.A., and A. G. R. Mackenzie, A.R.I.B.A., Architects.

Royal Academy Exhibition, 1911.

NATIONAL MUSEUM OF WALES, CA

PHOTO-INK. SPRAGUE & Co LTD 4 & 5, EASTHARDING STREET, FETTER LANE, E.C.

EUM OF WALES, CARDIFF.—Design by Messrs. H. V. Lanchester, F.R.I.B.A., and E. A. Rickards, F.R.I.B.A.



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SENNOWE PARK, NORFOLK.—Mr. G. J. Skipper, F.R.I.B.A., Architect.

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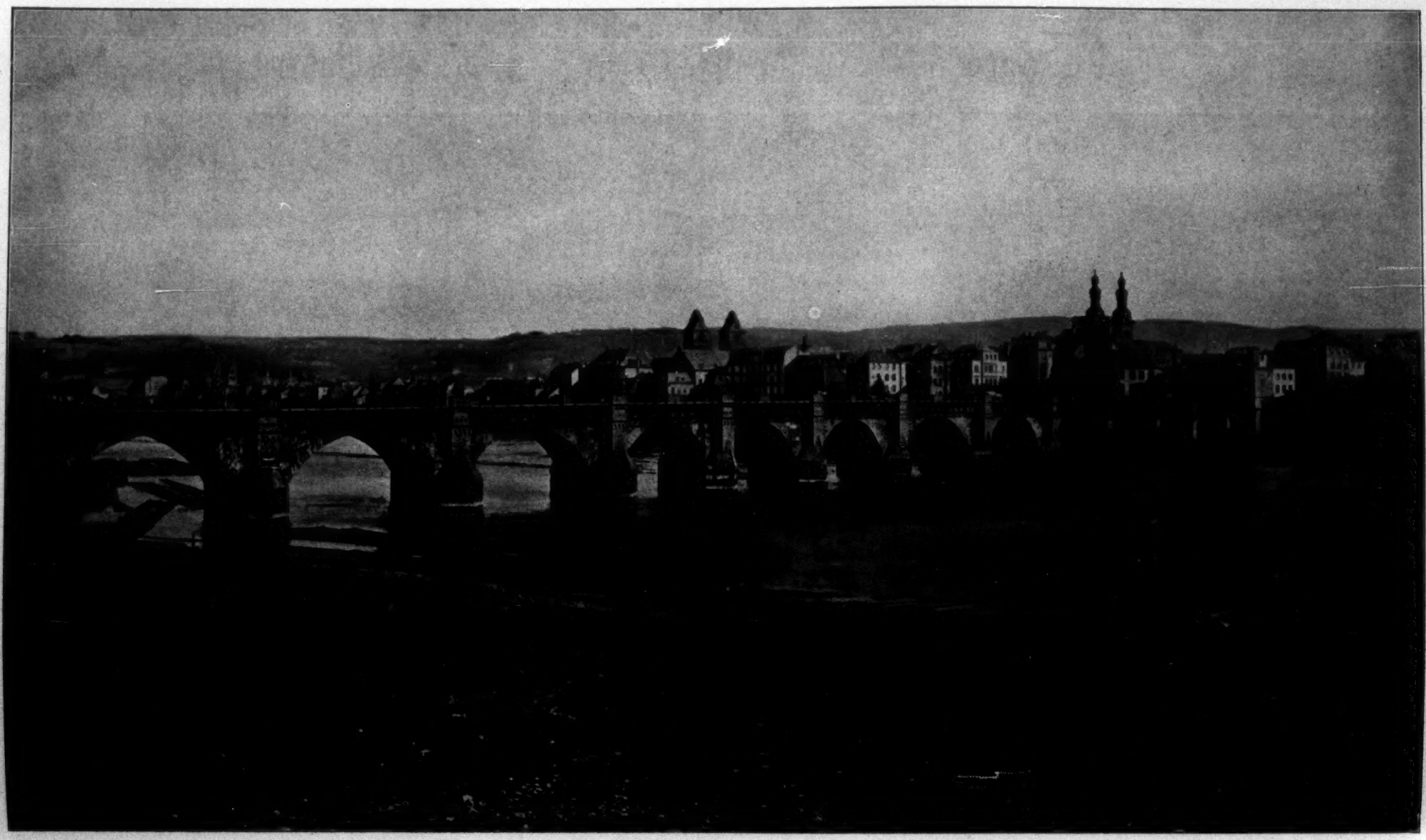

Photo by Frith.

MOSELLE BRIDGE, COBLENZ.

"THE STORY OF THE BRIDGE."—VII.

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Photo by Frith.

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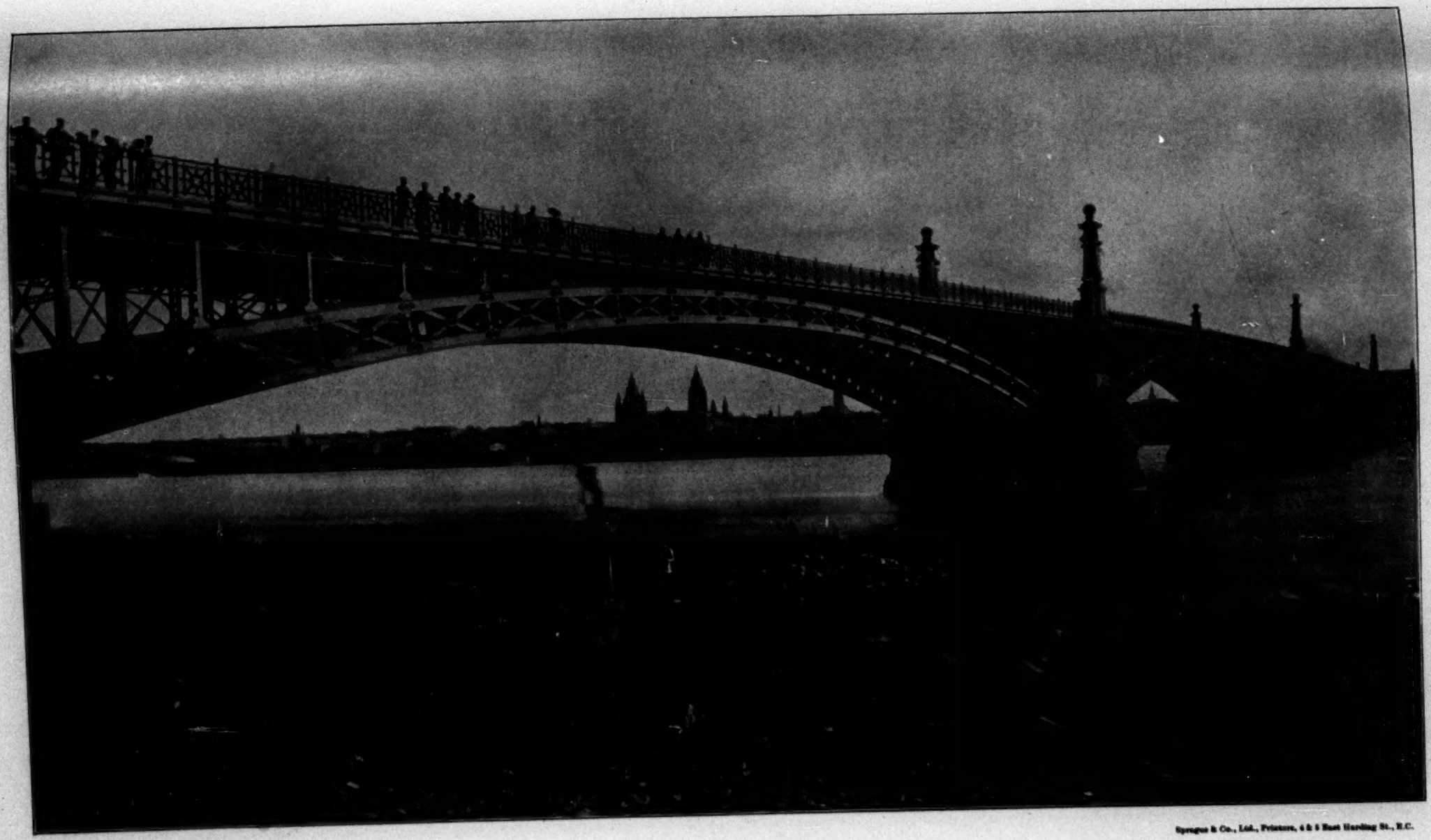

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NEW BRIDGE, MAYENCE. FROM CASTEL.

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MONTHLY REVIEW · *of* · ENGINEERING.

Fig. 1. Maverick Cotton Mill: General View (July 27, 1910).

MAVERICK COTTON MILL, BOSTON, U.S.A.

IN our issue of April 28 last details were given of the Massachusetts Cotton Mill, built over a canal, from the designs of Messrs. Lockwood, Greene, & Co., of Boston. In the present article we illustrate the main structural features of another large cotton mill designed by the same firm, who also were the general contractors.

The building is of interest as an example of rapid construction in reinforced concrete, as shown by the photographs reproduced, and also by the record of 100,000 sq. ft. of floor surface completed within one month.

It was at first intended to adopt what is termed in America ordinary "mill construction," but, as the tenders submitted by building contractors were considered to be too high, copies of the plans prepared by Messrs. Lockwood, Greene, & Co. were furnished to two construction companies, each having their own system for reinforced concrete. One of these was the Hennebique Construction Company, of New York, whose tender was ultimately accepted on the basis of working drawings prepared by them from the general drawings.

Situated at East Boston, at the northern side of the harbour and opposite the main portion of the city, the buildings occupy a site near the water front, as shown by Fig. 1, which is a general view of the spinning mill taken four months after the commencement of the concrete work.

The mill comprises four buildings:—(1) spinning mill; (2) weaving shed; (3) power-house; (4) office building.

The spinning mill is 550 ft. long by 130 ft. wide by two stories high, and is built in bays measuring 25 ft. by 10 ft. 8 in. in plan. It also has a basement story, and provision was made in the design of the columns for adding two stories above the existing flat roof, which will then become the second floor of the building. The mill equipment at present includes 50,000 spindles for cotton spinning.

The soil on the margin of the harbour at East Boston is of marshy character, and to enable it to support the weight of the buildings was consolidated by means of timber piles driven during the autumn of the year 1909. Upon these piles were constructed the footings of the exterior and interior columns supporting the reinforced concrete skeleton of the mill, this framework being monolithic throughout and comprising columns, wall lintels, main girders, joists, floors, and roofing.

Construction was commenced at the beginning of March, 1910, the position of affairs on March 7 being indicated by Fig. 2, representing the erection of moulds for the reinforced concrete columns. This view shows the chaotic state of the site of that period, with the column moulds in long trenches partly full of surface water. In the background may be seen the centring for four of the saw-tooth roof spans of the weaving shed, and the construction tower provided for handling concrete and other materials.

The rapidity with which operations were pushed forward is shown by comparing Fig. 2 with the photograph reproduced in Fig. 3, taken on May 4, or only fifty working days later, when a large area was covered by the moulds for beams at ground-floor level, several bays the full width of the building were partly completed to first floor level, and several others to roof level. In Fig. 3 a second construction tower may be seen at the right-hand side for serving men engaged on the mill building, the weaving shed and its construction tower being hidden behind the spinning mill.

The rapid progress made during the months of May and June is sufficiently indicated by Fig. 1, which is from a photograph taken on July 27, but we are informed that as a matter of fact all the concreting on the spinning mill was completed by July 1. Each of the floors in this building covers an area of 74,000 sq. ft., the total area of the three floors and flat roof being about 6¾ acres. Operations were undoubtedly facilitated by the large amount of duplication in the design, which not only conduced to rapid work, but also to economy of timber used in the form of moulds, shuttering, and centring. The moulds were used four times on different parts of the building.

The weaving shed, providing accommodation for 1,200 looms, measures 340 ft. by 231 ft., and is designed with bays of 26 ft. by 21 ft. 4 in. in plan. It comprises basement and ground floor stories, the latter covered with a roof of the saw-tooth type.

Fig. 2. Spinning Mill: Erecting Column Moulds (March 7, 1910).

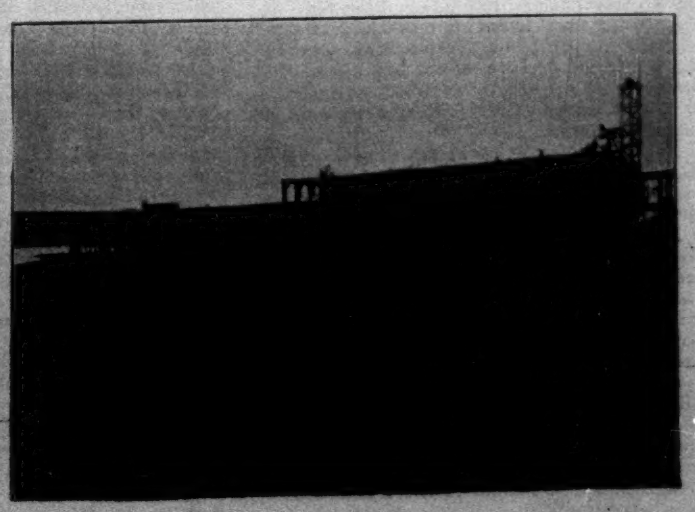


Fig. 3. Spinning Mill: Constructing Framework (May 4, 1910).

Fig. 4. Weaving Sheds (April 20, 1910).

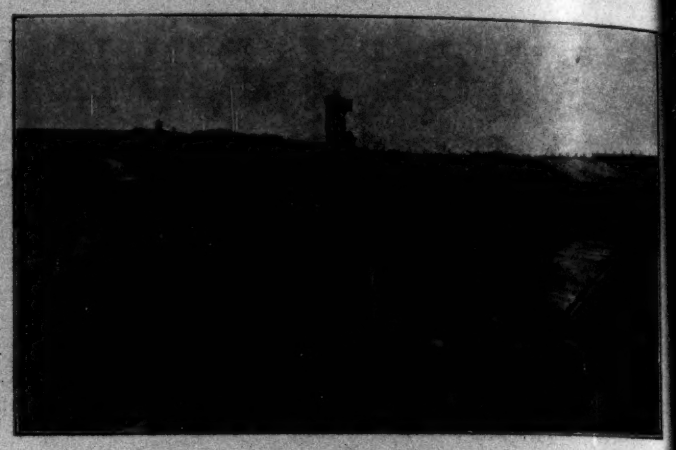


Fig. 5. Weaving Sheds (May 24, 1910).

Arrangements have been made for enlarging this building to four times its present capacity.

Construction was commenced towards the end of February, 1910. By April 20 a considerable portion of the building had been completed, including roof trusses and covering, and a large area provided with columns and timbering for concreting the ground floor. This stage is illustrated by Fig. 4, in the foreground of which can be seen the pits excavated for the construction of further columns on the area to be covered by the basement floor.

Fig. 5 indicates the substantial progress made during the succeeding month. The building was completed early in June so far as concerns the reinforced concrete work. A noteworthy feature of the shed is that the roof trusses and roof covering, except where glazing occurs on the north side of each span, are entirely of reinforced concrete. Although more costly than steel roof trusses, and ordinary covering, this method of construction is undoubtedly good, regarded from the standpoint of fire resistance, and it also has the merit of permitting the entire building to be moulded as a monolithic structure.

The power-house is a comparatively small building, measuring 80 ft. by 62 ft. in plan, and comprising a single-story boiler-room, with basement and a single-story engine-room. This building was commenced in May and completed during July. The office building, 40 ft. long by 30 ft. wide, with two stories and basement, was constructed about the same time.

FOUNDATION LOADS.—I.

In an instructive lecture delivered several years ago Professor Boyd Dawkins discussed the relation of geology to engineering, with special reference to the utilisation of subterranean water for the benefit of the population. The study of geology is naturally of much importance in other branches of engineering work involving operations at considerable depths. In architectural practice the science of geology affords less aid to the designer, who is usually occupied with glacial drift and comparatively recent accretions of surface material.

Hence a moderate knowledge of geology will carry the architect a long way—at any rate, so far as concerns building construction in countries not subject to serious earthquakes.

Numerous ancient buildings in all parts of the world show conclusively that early architects devoted much thought to the nature of the ground on which they were about to build, and that they adopted precautions which in principle are closely allied to modern methods.

One excellent illustration of this fact is afforded by the foundations of the Campanile of St. Mark, Venice, which, as originally proportioned, proved capable of sustaining enormous pressures for more than a thousand years, and still remain in the foundations of the new tower.

The original Campanile was a marked exception to the general rule that failures of masonry work are more frequently due to defective foundations than to weakness of the superstructure.

Other buildings of considerable age demonstrate the fact that early architects did not always carry the practice of applied geology quite far enough to ensure permanent stability. Winchester Cathedral and St. Paul's Cathedral illustrate this point, for, as shown by recent troubles, a somewhat greater foundation depth would have rendered these structures independent of the causes which have gradually reduced the bearing power of the upper strata.

In mentioning these examples we intend no slur on the memory of the original designers, our object being merely to indicate the connexion between geology and architecture.

Although the largest buildings erected to-day do not surpass in magnitude those constructed ages ago, the average dimensions, and particularly the height of modern buildings, has very much increased in cities and towns. Consequently, architects feel more than ever before the need for careful investigation into the design of foundations and the loads that may safely be imposed upon various kinds of rock and soil.

This attitude is denoted in a sense by the action of the Science Standing Committee of the Royal Institute of British Architects in asking members to furnish particulars of their personal experience concerning foundation loads.

Although heartily in accord with the movement in question, and believing that it will bring forth much interesting information, we are not sure that the facts collected will be suitable for anything more than general guidance. One reason for this supposition is to be found in the fact that conditions vary considerably according to locality and even in the same locality, and another is the difficulty of obtaining exact data which lend themselves to comparison.

A somewhat kindred appeal on the subject was recently made by an eminent American civil engineer, with the result that out of 300 engineers in various countries who were asked to contribute information as to safe pressures on foundations, only thirty replies of any value were received. Even those were indefinite on important matters connected with the pressures and local conditions.

The architect who builds upon solid rock is free from the uncertainty attaching to the pressure that may be applied to many kinds of soil, for all but the softest varieties of rock are capable of sustaining with perfect safety the greatest load due to any form of masonry foundations. Table I. gives the minimum and maximum results of numerous tests on some representative varieties of British rock, and for comparison the results obtained between 1883 and 1905 at Watertown Arsenal, U.S.A.

TABLE I.—COMPRESSIVE RESISTANCE OF VARIOUS ROCKS TESTED IN THE FORM OF SMALL CUBES. RESULTS IN TONS (2,240 LB.) PER SQUARE INCH.

Kind of Rock.	British.	American.
Granites	144–1,614	131–1,780
Basalts	769 1,580	—
Slates	658–1,052	—
Sandstones	70– 956	233–1,550
Limestones	156– 778	280– 965

Owing to the fact that available data concerning the compressive resistance of rock have been furnished by testing cubes of different sizes, it is impossible to collate the figures in the form of a table giving a reliable guide to the relative strength of strata occurring in various districts of the kingdom.

Moreover, it is known that a given volume of material under compression exhibits much greater resistance when incorporated in a larger mass of the same material than that shown by the same volume in the form of a test cube.

Thus, a 12-in. cube examined in the testing machine will not bear so heavy a pressure as can be applied to an area of 144 sq. in., constituting part of the surface of a block measuring, say, 10 ft. in every direction. The reason for this increased resistance is obviously to be found in the lateral support furnished by the surrounding material and the distribution of the pressure over a larger area. But it is not easy to compute with any degree of accuracy the greater strength so afforded.

Professor Ira O. Baker states in his standard treatise on "Masonry Construction" the results of experiments made by him with the object of establishing the ratio of the crushing pressure distributed over the whole surface of a block and the crushing pressure concentrated on a small portion of a block.

Table II. gives the results of the experiments, where the concentrated pressure was applied by means of a steel die, with the area of 0·277 sq. in., at varying distances from the corner of a large block, and the ordinary crushing strength was obtained by testing to destruction cubes of the same materials as used for the first experiments.

From this table it is clear that the resistance increases very rapidly with the thickness of the block, and with the distance of the concentrated pressure from the edge of the block.

These results, which are of special interest, should be found useful for guidance in various classes of design, as well as in connexion with the bearing power of rock.

If any uncertainty exists with respect to the adequate strength of the rock which is to form the site for a building, the proper course is to have carefully-selected specimens tested, and to take the safe-bearing load at one-eighth the compressive resistance of the weakest cube.

Whatever be the nature of the soil revealed by the excavation of foundation-pits or trenches, it is always necessary for the designer to know something of what lies below. In the case of moderately-heavy buildings, examination should be made to the depth of from 3 ft. to 5 ft., while for very heavy buildings trial borings should be carried down to much greater depths in order that the character of the underlying strata may be reliably gauged.

A simple and effective method of determining the bearing power of the soil in doubtful cases is to apply a test load to a square foot or square yard of the surface exposed by excavation or at the bottom of the hole dug for the purpose. By observing the consequent settlement, it is easy to arrive at a trustworthy conclusion. At the same time the designer must take due account of attendant circumstances, such as the compactness of the soil, the probable influence of variations of the underground water level—

TABLE II.—COMPRESSIVE RESISTANCE OF VARIOUS MATERIALS UNDER CONCENTRATED AND DISTRIBUTED PRESSURES. (IRA O. BAKER.)

Number.	Material.	Thickness of Block.	Centre of Die from Edge.	Crushing Strength. Concentrated Pressure.	Crushing Strength. Distributed Pressure.	Ratio.
		In.	In.	Lb. per sq. in.	Lb. per sq. in.	
1	Lime mortar	½	2	3,610	1,340	2·7
2	Marble	1	2	18,050	10,500	1·7
1	Marble	2	2	36,100	10,100	3·6
3	Marble	2½	2	11,801	2,054	5·1
4	Brick	3	2	31,046	3,453	9·0
5	Limestone	3	2	51,600	3,696	14·0
6	Sandstone	3	2	75,361	4,671	16·0
7	Limestone	4	2	64,077	3,453	18·5
8	Limestone	7	2			
4	Sandstone	3	2	51,600	3,693	14·0
9	Sandstone	3	3	59,204	3,696	16·0
10	Sandstone	3	4	75,810	3,696	20·5
7	Limestone	4	2	75,361	4,761	16·0
11	Limestone	4	3	102,900	4,761	22·0
12	Limestone	4	4	111,188	4,761	24·0
8	Limestone	7	2	64,077	3,453	18·5
13	Limestone	7	4	87,720	3,453	25·0

practical experience and discrimination being aids whose value should never be overlooked.

No classification, even if accompanied by the most complete obtainable records of bearing power, could afford a true and precise indication of the safe load for soil in different localities. The various kinds of soil do not occur in standardised qualities like manufactured products, they are found in strata of varying consolidation and thickness, and are more or less intermixed one with another, and more or less permeated by water.

SCREW PILES IN THE VICTORIA PIER, FLEETWOOD.

THE new promenade pier opened at Fleetwood in June last is a structure of steel and cast-iron with a timber jetty, and includes entrance offices and a bandstand, with provision for the erection of a pavilion suitable for concerts and other entertainments.

The landward end is situated on the foreshort at a point opposite Windsor-terrace, on the Fielden Esplanade, the work having been executed for the Fleetwood Victoria Pier Company, Ltd., to the designs of Mr. J. E. Stafford, civil engineer, of Blackpool.

The entrance offices and approach are constructed on a foundation formed by filling broken stone, boulders, brickbats, and sand into the space bounded on the south side by the sea wall of the Fielden Esplanade and on the north, east, and west by new concrete walls. The entrance building is of brick, and includes suitable accommodation for the pay offices and stores. All columns or piles in the pier are of cast-iron with bracing of steel railway rails, girders, and joists being of mild steel, with the exception of some timber joists laid on top of the cross girders, and the decking is of creosoted timber.

As shown in the accompanying illustration, the piles are of 10-in. diameter, with a screw flange or a pointed end for driving to the bottom length, and the requisite collars, caps, and flanges to the upper lengths. As the details of construction are clearly shown in the drawing, it is unnecessary to state them fully. The piles fitted with screw flange were screwed into position and sunk sufficiently deep to take a firm and solid foundation in the clay subsoil underlying the sandy bed of the foreshore. In cases where the piles were driven in the ordinary way, they were sunk until a vertical movement of not more than ¼ in. was caused by ten blows of a 20-cwt. monkey falling from the height of 6 ft.

Screw piles of the type employed at Fleetwood were originally invented by Mr. Alexander Mitchell, and have been largely adopted in India for the foundations of railway bridges, as well as in marine works of various kinds throughout the world. Owing to the greatly extended area of the bottom section, the bearing power of screw piles is proportionately large, and may often be utilised as an economical means of forming secure foundations in soil of unstable nature.

ENGINEERING NOTES.

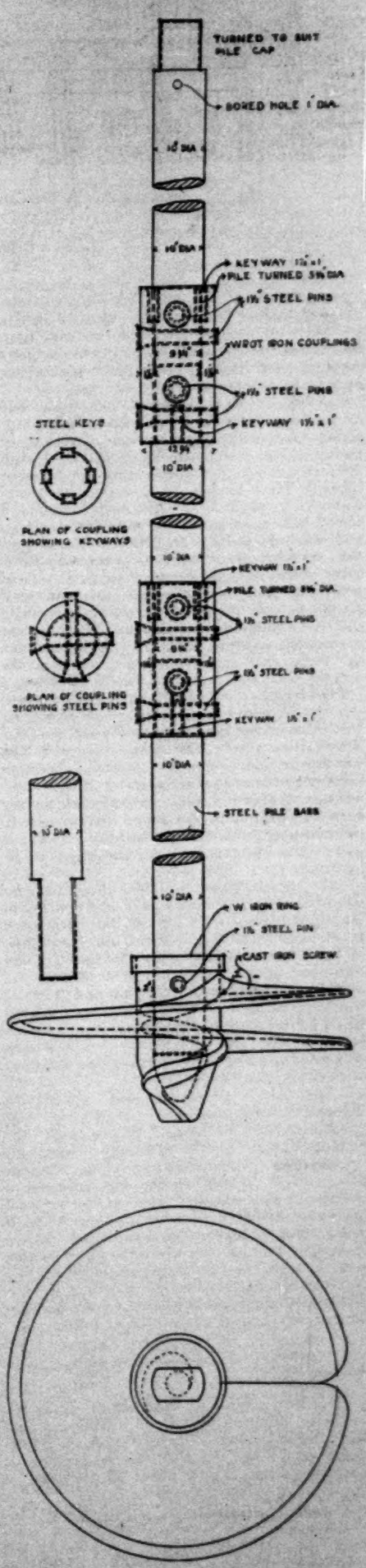
Deep-Level Aqueduct, New York.

TO BRING water from the new reservoir at Hill View, in Yonkers, through the Borough of the Bronx and Manhattan Island, and under the East River to Brooklyn, it has been decided by the Board of Water Supply to construct an aqueduct in the form of a tunnel about 17½ miles long, ranging in diameter from 11 ft. to 15 ft., and in depth from 200 ft. to 750 ft. below surface level. This important engineering work will be executed throughout in solid rock, consisting of the gneiss, schist, and limestone formations underlying New York City. The tunnel will be lined with concrete, with the average thickness of 15 in., and special provision made for backing in places where soft rock may be encountered. The plans make provision for the distribution of water by way of twenty-three uptake shafts of 14 ft. diameter in each of which will be placed a 4-ft. diameter pipe. Two of the shafts are specially devoted to drainage purposes, one at a low point of the tunnel near the Harlem River, and another at the lower end of Manhattan Island. During construction the twenty-three shafts will be used as bases for the conduct of driving operations, as also will an additional shaft to be sunk at the northern end of the tunnel, and afterwards filled up with concrete.

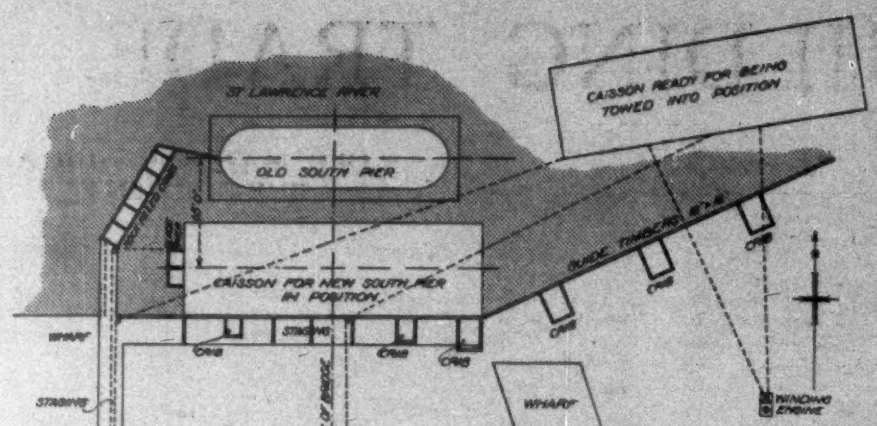
Although careful geological investigations have been made by experts on behalf of the Board of Water Supply, the contractors cannot be sure that the rock will be sound throughout, and will have to face the risk of encountering serious underground springs. The tunnel is at so great a depth as to prohibit the use of compressed air, and success can only be attained by pumping out water faster than it flows into the workings. Electrically-operated pumps will be employed throughout, and in cases of emergency the various power-stations in the city can be drawn upon for current. Therefore, given ample resources in the form of pumps, there should be no lack of motive power. Of course it is quite possible that water may be liberated in tremendous volume, but it is hoped that trouble may be averted by keeping the tunnel lined well up to the working face and by driving advance headings to tap underground springs before they can deluge the workings. Nevertheless, the risk both to the contractors and the city authorities is of sufficiently onerous nature. When completed, the tunnel will serve as the main aqueduct for the distribution of 500 million gallons of water daily to the various districts of Greater New York along the line. The undertaking is a remarkable illustration of the arduous tasks rendered necessary by the continued growth of large cities in modern times.

New Station Buildings at Baker-street.

THE Metropolitan Railway Company have commenced operations on the new building for Baker-street Station, with a frontage of 200 ft. long on Marylebone-road. Additional accommodation for trains will also be provided, including arrangements that will afford much-needed facilities for the heavy traffic into and out of the City. A feature of the new building will be a spacious concourse 80 ft. long by 50 ft. wide, with stairways of ample width leading down to the station proper. At present the building will only extend to the height of one story above street level, but later it is intended to carry up the building in the form of a large hotel.



Victoria Pier, Fleetwood. Screw Pile.



Quebec Bridge Pier Caissons.

Quebec Bridge Pier Caissons.

For the new piers destined to support the giant cantilevers of the Quebec Bridge three large caissons have been built—one for the south pier, 181 ft. long by 55 ft. 6 in. wide, and two for the north pier, each 85 ft. long by 60 ft. wide.

Caisson No. 1, completed last year, was originally intended for the north pier, but, owing to difficulties in the way of sinking it there, was removed to the dry dock at St. Joseph de Levise and kept there until the present spring. After having been strengthened and thoroughly caulked it was floated out and towed into position by the aid of steam tugs and winding engines, as shown in the accompanying diagram. This caisson is placed 65 ft. south of the old pier, centre to centre, a space of 10 ft. clear being left between the two structures. As the river bed is free from water at low tide the site was levelled in advance, and to assist operations a breakwater of rock-filled cribs was built on the up-stream side, as well as the staging and guide timbers shown in the plan.

The caisson was floated out of the dry dock on May 28 and towed to within about 150 ft. from the bridge, a distance of some 9 miles. Four steel wire cables connected with the winding engines were then attached, and the huge structure was successfully drawn into position, the only difficulty experienced having been to guide it in the rapid current due to the incoming tide. The caisson drew 10 ft. of water, the unsubmerged portion being 30 ft. high.

Caissons No. 2 and No. 3 for the north pier are completed, and were towed into position in May and June last. No. 2 has been sunk several feet below the river bed, and the sinking of No. 3 has been started by this time. These two caissons were 33 ft. high at the time of launching and drew 8 ft. 6 in. and 9 ft. of water respectively. They have been placed 65 ft. to the south of the old north pier, centre to centre, thus providing for the cantilever span of 1,800 ft., as in the original bridge design.

Some Doubtful Points in Hot-Water Heating.

A PAPER read before the Institution of Heating and Ventilating Engineers by Mr. E. R. Dolby, M.Inst.C.E., discusses some of the methods used at the present time to determine the effective head in low-pressure hot-water installations where gravity alone is relied upon to produce the required circulation. Assuming a simple case where the water column is 40 ft. high, the flow temperature 200 deg. F., and the return temperature 160 deg. F., Mr. Dolby gives the head calculated by the formulæ of four well-known authorities as follows:—

Hood	6·838 in.
Baldwin	6·708 ,,
Carpenter	3·800 ,,
Rietschel	6·710 ,,

It is seen, therefore, that, whatever be the methods adopted by Hood, Baldwin, and Rietschel in the particular case cited, the results differ very little, but that the head given by Carpenter's rule is only about 53 per cent. of the average value of the other three.

Professor Carpenter, in "Heating and Ventilating Buildings," states that "most computations of the velocity of circulation of hot water have entirely neglected the effect that the mass or weight of the water moved has on the velocity, and hence the results as computed have been many times greater than actually found." On another page he says:—"As result of experiment the writer found considerable variation in different measurements of velocity, but in no case did he find a velocity greater than that indicated by the formula." The formula in question is:—

$$v = \sqrt{\frac{2gh\,(W_1 - W)}{(W_1 + W)}}$$

where W_1 represents the weight of water in the return column, and W the weight of water in the flow column.

The author admits Professor Carpenter to be one of the first authorities on heating in the United States, while pointing out that Professor Rietschel has for many years been esteemed one of the foremost authorities on the subject in Germany. Apparently it is owing to the great difference between the results given by the formula of these authorities that Mr. Dolby calls into question the theory of Professor Carpenter.

At first sight, he says, it would appear that it should be easy to determine which of the two formulæ is the correct one, but the matter is not so simple as it appears, accurate results depending upon a correct estimation of the frictional resistance of the internal surface of the pipes used, and the diminishing viscosity of water as temperature increases.

Discussion on the paper will be continued at the October meeting of the Institution, when it is expected that several interesting communications will be forthcoming.

The Risorgimento Bridge, Rome.

CONNECTING the artistic and ethnographic sections of the International Exhibition in Rome, the bridge opened this year across the River Tiber is remarkable as including the longest reinforced concrete arch hitherto completed, the clear span being 328 ft. and the rise 32·8 ft. The arch proper consists of a curved slab, approximately 66 ft. wide, 18 in. thick at the springings, and 8 in. thick at the crown. The spandrels are hollow, being formed of longitudinal and transverse walls and partitions supporting the roadway above. The abutments are founded on piers sunk by the Compressol system, and, like all other parts of the structure, consists of reinforced concrete. This notable work, which has been tested to the satisfaction of the city authorities, was executed by the Porcheddu Company, having been commenced in November, 1909.

Lifting Magnets.

AN application of electricity which has not received the attention in this country that it deserves is indicated in the title of this note. A recent paper by Mr. H. F. Stratton, of Cleveland, U.S.A., gives particulars demonstrating the practical utility of lifting magnets in the iron trade. For a foundry turning out 35 tons of metal daily the crane and magnet installation with the lifting capacity of 1,350 lb. is about 800*l.*, and the cost of handling pig-iron is not more than ¾d. per ton. Depreciation is stated at 1¼d. per ton, thus bringing up the total cost to 2d. per ton. As the cost of handling by manual labour is probably about 5d. per ton, the economy of the magnet plant is obvious.

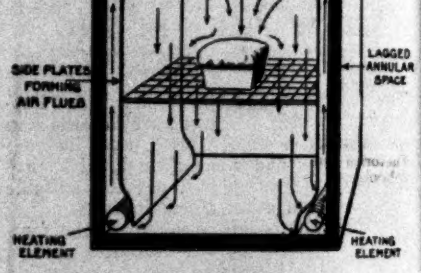
Electric Cooking Apparatus.

IN the *Journal* of the Institution of Electrical Engineers a paper by Mr. Harold Gray discusses the position of "Electric Heating as Applied to Cooking Apparatus," a subject of considerable interest to many of our readers in their professional capacity. The author brings forward the strong and weak points of the electrical system with the object of indicating the directions in which further improvements are required to popularise a method of cooking possessing obvious advantages over gas from the hygienic standpoint.

Perhaps the most important piece of electric cooking apparatus in general use and the one which is most difficult to make satisfactory in operation is the oven. Some makers follow the lines of the gas range by combining the oven with hot plates and similar appliances. Others make the oven an independent apparatus, an arrangement generally giving the most satisfactory results. It should be noted that the heat-energy applied inside an oven is consumed and lost in three ways: (1) Cooking proper, (2) loss by radiation, (3) loss due to the escape of hot air chiefly when the door is opened. The greatest loss is that due to (3), and if the oven can be arranged so that the door need only be opened when the food is put in and taken out, considerable heat economy may be effected.

The author has devoted some time to the problem of electric oven design, and believes that the whole secret of success depends on two things—the provision of uniform heat throughout the cooking space, and a steady circulation of the hot air currents in the correct directions to avoid "airlocks" over and around the food.

Given these two conditions the cooking is



Gray's Electric Oven.

perfectly uniform throughout the oven, and the door need not be opened periodically for the purpose of changing the position of the objects under treatment. It is essential, however, that there should be a light inside and an inspection window, as well as an interior thermometer indicating the temperature.

The accompanying sketch illustrates the arrangements of the electric oven devised by Mr. Gray. Heat is generated by two elements at the bottom, the heated air rising in two side flues formed by plates, emerging at the top into the oven proper. After permeating the cooking space the heated air again passes over the heating elements, as shown by arrows, and the cycle is repeated as long as requisite. The oven is surrounded by lagging, from 1½ in. to 2 in. thick, composed of slag wool or finely divided asbestos.

The type of oven described represents an immense advance on the ordinary electric, gas, or fuel oven, where too much top, bottom, or side heat usually prevails, its uniformity of temperature, and the perfect distribution of heat being specially noteworthy features. As compared with a gas oven, where the food is bathed in the products of combustion of impure gas, the apparatus shows to much advantage, and from figures given by the author it appears that the average cost of operation is not more than that of a gas oven.

The paper to which we refer will probably have the effect of stimulating the endeavours of electrical engineers to advance the application of electricity in the direction indicated, and may be commended to the attention of architects concerned in the equipment of public institutions, hotels, and other buildings where hygienic cooking is an important consideration.

THE BUILDING TRADE.

THE NEW YORK BUREAU OF BUILDINGS IN 1910.

A REPORT just made to the Borough President of Manhattan by Mr. R. P. Miller, M.Am.Soc.C.E., records the operations of the Bureau of Buildings for last year, and in addition to the customary statistics contains a good deal of information which should be interesting to builders and public authorities in our own country.

Building Applications.

The activity of building contractors on a restricted site where every square foot of ground, save public parks and open spaces, has long ago been allocated, is shown by the record that in 1910 plans were approved for buildings to cost over 20,000,000*l.*, and including 800 new structures representing nine-tenths of that value. The average cost per building amounted to 23,000*l.* Compared with the figures of 1870 for the entire city, then including Manhattan and much of the Bronx, those for 1910 show two-and-three-quarter times the number of buildings and seven times the value per building, the contrast appearing more remarkable when it is borne in mind that at the earlier date the process of natural development was still in progress.

The subjoined table gives an analysis of building applications during 1910, excluding alterations to existing structures :—

Class of Building.	No.	Total Cost.	Cost per Building.
		£	£
Dwelling Houses	48	391,200	9,100
Tenement Houses	208	7,384,600	35,500
Hotels	7	191,000	27,280
Stores	230	6,106,940	26,560
Office Buildings	44	2,478,120	56,320
Factories and Workshops	33	441,380	13,380
Schools	11	481,400	43,760
Churches	11	328,000	29,820
Municipal Buildings	8	631,600	78,960
Public Buildings	40	530,420	13,260
Stables	60	293,944	4,900
Miscellaneous	143	81,941	580

Types of New Buildings.

A satisfactory feature presented by the buildings in respect of which applications were made is the large proportion represented by fire-resisting construction, as demonstrated in the subjoined table :—

Class of Construction.	No. of Buildings.	Percentage of Buildings	Floor Area sq. ft.	Percentage of Floor Area.
Fire-resisting	250	31·0	19,128,300	68·0
Ordinary	413	51·3	8,766,200	31·2
Miscellaneous	136	16·9	201,000	0·7
Frame	6	0·8	33,200	0·1

Most of the fire-resisting buildings are in the Murray Hill district, bounded by Third and Ninety-sixth streets, and Lexington and Eighth avenues, but a good many are situated in two districts largely occupied by office buildings.

Breaches of Law.

Omitting cases relating to lift regulations, 6,137 breaches of the building law were reported during the year. It is somewhat curious that nearly 22 per cent. of these were for starting new buildings and alterations without a permit. A class of violation that has been particularly troublesome is the erection of frame buildings within the "fire limits," where such structures are prohibited, most of the buildings have been completed before an injunction could be obtained. The futility of attempting to enforce the building law by levying fines is emphasised in the report, and it seems clear that prompter procedure and more drastic punishment are required to insure obedience.

Unsafe Buildings.

During the year 2,341 buildings were reported as unsafe, and of these 1,935 were made safe by the owners on order from the Bureau, in 104 others application to the Supreme Court had to be made, and in others, again, the buildings were demolished.

One very useful duty of the Bureau, finding no counterpart in Great Britain, is that of undertaking all emergency work that may arise in connexion with building operations. Thus the Bureau attend directly to the shoring or demolition of buildings that have partly collapsed, the object being to safeguard the public with the least possible delay. In one special case last year they had to dig out the body of a man who had tunnelled under Ludlow-street for the purpose of robbing a jeweller's shop, and was killed by a fall of the tunnel roof.

Fire Escapes.

The report states that strenuous resistance is offered to orders made by the Bureau, in compliance with sects. 103 and 108 of the Building Code, to provide adequate egress from buildings in case of fire or panic. Complaints as to the lack of facilities have been received from several sources, including the State Factory Inspector and the Fire Department. During 1910, some 872 cases were reported in which exit facilities were absent or defective, and we learn that a large number of cases still await settlement, many of them being from two to seven years old. This is a state of things clearly demanding attention. The 872 cases mentioned are thus analysed :—Outside escapes needed, 495; escapes out of order, 227; obstructions to be removed, 89; stairways required, 43; doors to open outward, 14.

Lift Inspection.

Periodical inspection is made by the Elevator Division of 8,420 passenger lifts, with the result that about 1,000 breaches of the rules were reported during the year. No inspection is made of the 10,000 goods lifts in the borough. Unfortunately, lift accidents are not fully reported at present, but from a record attempted during the last five months of 1910 it seems ten passenger and four goods lift accidents occurred, with seven persons killed and fourteen injured. Six of these misadventures were due to defective ropes and machinery, and five to carelessness of passengers.

In consequence of an accident early in the year, when a number of persons were injured owing to the fracture of the sheave strap in the lift of a ten-story building, a new regulation was issued demanding the reconstruction or strengthening of all such straps in use. This regulation has been rigorously enforced, and its wisdom is justified by the discovery that in sixteen cases the straps were found broken when the machinery was taken apart, and it was mere good fortune that more accidents had not occurred.

Brick, Cement, and Concrete Tests.

An important duty undertaken by the Bureau is the testing of materials in the form of bricks, in order to furnish data for the issue of regulations and the modification of the regulations already in force. The following table gives the average results of tests made by the Bureau up to the end of last year :—

Kind of Bricks or Blocks.	No. Tested.	Modulus of Rupture lb. per sq. in.	Compressive Strength lb. per sq. in.		Absorption by Weight per cent.
			Dry.	Wet.	
Clay (common)	59	469	3,959	2,702	15·00
Clay (pressed)	6	983	6,361	5,934	9·80
Cement 1 : 4	5	475	4,394	2,594	10·97
Concrete (limestone) 1 : 1·2 : 2·4	7	805	4,780	2,587	—
Concrete (trap) 1 : 2·5	10	686	3,856	3,336	9·40
Clinker	12	506	4,746	3,678	5·70
Sand Lime	150	560	3, 78	3,084	12·34

OLD MATERIALS ON A BUILDING SITE.

FROM A LEGAL CONTRIBUTOR.

WHO is entitled to the old materials on the site when new buildings or works of any other description are to be erected? This is a question which is often asked in practice, and it is important for the builder to know the correct answer. Sometimes, of course, the matter is provided for in the contract entered into between the parties; and to avoid the possibility of dispute it is always best to insert a clause dealing with old materials, for, in spite of a common belief to the contrary effect, it is clear law that an obligation upon a contractor to clear away old materials does not necessarily vest those materials in him. Again, where, by his contract, a contractor is bound to make an excavation, the material excavated does not necessarily become vested in him. On the contrary, if a contractor make use of materials thus supplied to him, the employer may set off their price against the amount due under the contract. For instance, in one case the plaintiff contracted to do certain work for the defendant, and to find the materials which the plaintiff made use of in the work. It was held that the defendant was entitled to deduct the value of the materials supplied by him from the contract price.

The importance (to the employer) of some clause dealing with old materials lies in the fact that, if nothing is said about them, the contractor may remove them. Having removed them, he may sell them. In that case, if he were to become bankrupt, the employer could not get the goods back, but would be relegated to his right of proving for their value in the contractor's bankruptcy. In these circumstances the architect should be careful to secure the insertion of an old material clause in the contract, by which his employer is to become bound. Where the contract for erecting a building or executing other works makes no reference to old materials, it seems that the contractor will be under an implied obligation to clear them away. In drawing his specification, the architect often inserts a clause to the following effect :—"Materials on the site to be used as far as possible." If a tender is made by a builder on the basis of such a specification, care should be taken to ascertain whether any deduction has been made in respect of old materials. If the builder, having made no deduction, makes use of any of the materials, the architect may set their value off against the contract price; and even if he has made a deduction, but has not informed the architect of the fact, there may still be a set off. For instance, in a case tried in 1867, the plaintiff, a builder, sued for the sum of 800*l.*, the contract price payable on completion of the works. The architect had certified that the works were completed. The contract contained the following clause :—"All old lead to be displaced by new to become the property of the contractor, who will make a due allowance for same." The defendant employer pleaded a set off of 38*l.*, the estimated value of old lead. It was held that, as the contractor could not prove that he informed the employer or the architect that, in making his estimate, he had allowed for the value of the old lead, the set off was good.

The following is a convenient form of old material clause :—"All materials upon the site

or upon the space to be covered by the contract works at the date of the contract, and all materials and things excavated by the contractor from the works, shall remain the property of the employer until paid for by the contractor. Such of them as shall be approved by the architect for the purpose of the works shall be paid for by the contractor at a price to be named in his tender or, if not named, to be ascertained by the architect, and all other materials shall be removed by the contractor from, or deposited, stacked, or spead on the site as where and when directed by the architect."

In cases where the contractor is not permitted to remove gravel, ballast, etc., the following clause is sometimes used :—

"The contractor shall not sell or otherwise dispose of, except by using the same for the purpose of the contract and the works to be constructed and erected thereunder, any sand, stone, gravel, clay soil, or other material, or substance of any kind or description whatsoever which may be obtained from excavations or found on the ground by the contractor."

BOILER EXPLOSIONS IN 1910.

FROM the recently issued Board of Trade Report it appears that the total number of boiler explosions and personal injuries resulting therefrom during last year were above the average for the past twenty-seven years. Two satisfactory points, however, are that the number of persons injured was little above the average, and that the number of fatal accidents was only about half the average. As the term "boiler explosion" covers mishaps in steam pipes, steam chests, steam cooking ovens, and all kinds of apparatus where steam is used, the number of accidents reported is no criterion as to boiler explosions proper, and we are glad to find that there is no increase in serious explosions. Of the 103 explosions reported, sixty happened on land and forty-three on ships. The causes of explosion, as given in Appendix B, were as follows :—

Deterioration or corrosion, 26; defective design or excessive pressure, 32; defective workmanship or materials, 16; water-hammer, 9; ignorance or neglect of attendants, 8; miscellaneous, 12.

The following is a classified list of the boilers and apparatus in which explosions occurred :—

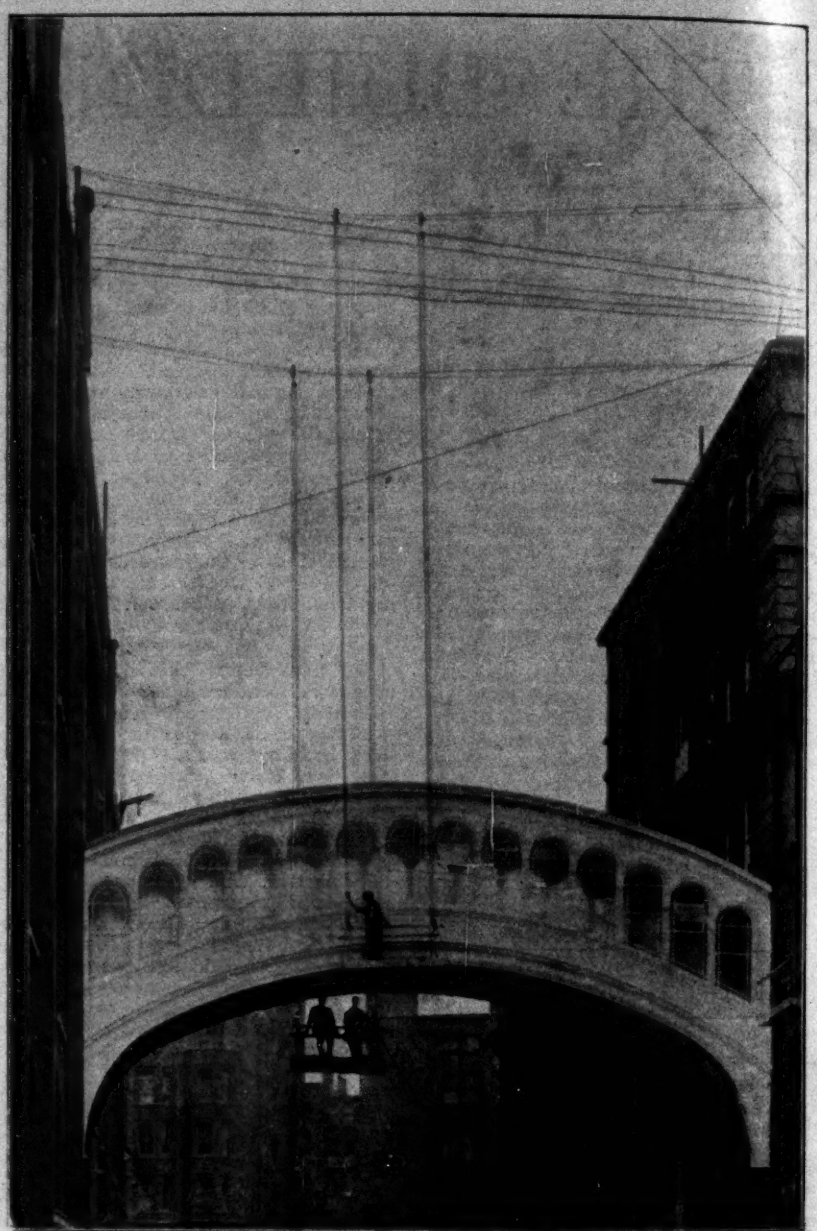
Horizontal multitubular boilers, 16; locomotive-type boilers, 3; water-tube boilers, 9; vertical boilers, 6; Lancashire boilers, 2; tubes in steam ovens, 16; heating apparatus, 5; steam pipes, stop-valve chests, etc., 30; miscellaneous, 19.

In forty six cases the boilers and apparatus were not subject to insurance or expert inspection, the latter being a safeguard which should always be adopted in connexion with steam generating plant. From the first classified list given above it will be seen that most of the accidents were due to preventible causes, and we hope that avoidable explosions may soon be obviated entirely. The valuable work of the Board of Trade in investigating all mishaps, whether serious or trivial, is certainly helping towards this desirable end.

PALMER'S TRAVELLING CRADLES AT THE ARMY AND NAVY STORES.

MANY of our readers are familiar with the bridge connecting the front and back buildings of the Army and Navy Stores in Victoria-street, Westminster, the structure in question being at such a distance above the intermediate street as to render it inaccessible by ordinary means for the purpose of exterior cleaning and painting. If ordinary scaffolding were employed, the cost of erection, with due provision for the conduct of vehicular and pedestrian traffic, would be quite disproportionate, as may be understood without much consideration. Thanks, however, to the suspended scaffold introduced by Palmer's Travelling Cradle and Scaffold Company, the difficulty has been readily surmounted in the case of this and various other large buildings in London and elsewhere.

The accompanying view shows two of the cradles suspended from overhead wire cables stretched between the two blocks of the Army and Navy Stores, enabling workmen to get at every part of the intercommunication bridge without the least trouble.



Palmer's Travelling Cradles at Work at the Army and Navy Stores.

It is unnecessary for us to give particulars as to the details of the cradles, as these were fully stated in our article of March 10 last on "Scaffolds for Steel-Frame Buildings."

ASPHALT: SUPPLIES AND PREPARATION.

JOSEPHUS, in his antiquities of the Jews, states that Nimrod, the grandson of Noah, incited the people to build a tower "which was so great and strongly built that its great height seemed, on the view, to be less than it really was. It was built of burnt brick cemented together with mortar made from bitumen that it might not be liable to admit water. The place where they built the tower is called Babylon." Herodotus says that, in building the walls of Babylon, the clay dug out of the trenches, afterwards to form the moat, was made into bricks as soon as it was carried up, and burnt in kilns. When they had a sufficient number the bricks were cemented together with hot bitumen, and at every thirtieth row craters of reeds were inserted.

The bitumen was obtained from the River Is, a tributary of the Euphrates, and was brought to Babylon; lumps of bitumen being found in great abundance floating in the river.

Josephus explains that it was collected in ships by those whose trade it was, and, being difficult to pick up, vinegar was poured over it, which stiffened it. Once having started one end into the ship the rest followed and continued until the ship was full. The sailors then cut it to prevent any more entering. As a steel or brass knife would not cut it, they had to resort to another expedient. They smeared blood across the bitumen, which caused a break immediately, and the inflow ceased.

In the alluvial plains of Assyria, both clay and bitumen were found, the bituminous cement bubbling out of the ground. It is collected by the Arabs at the present day.

There are also very early evidences of the use of bitumen as a lining for cisterns and water tanks.

Mineral pitch, asphalt or asphaltum from the Dead Sea, where it was also found in ancient times, is produced by the decomposition of animal and vegetable substances. In colour it varies from a black to a blackish brown not unlike coal in appearance. Its general nature is therefore resinous with a s.g of 1·5, and its chemical formula is $C_{17}H_{18}O$.

The lake at Trinidad having an area of about 99 acres is the most remarkable deposit, being of unknown depth intersected with streams of water. It also occurs in the surrounding country in deposits of varying size, and as of old floats down the rivers or is cast upon the seashore. It also is to be found in various places in Europe, but not to any great extent, usually being found in greatest abundance in hot climates.

In Cuba, a very fine asphalt is found known as Mexican asphalt, and also a fine asphalt of pure variety comes from Peru.

Asphalt stone, a limestone impregnated with bitumen, occurs in various parts of Europe in large quantities, is of greater commercial value. The best known are those of the Val de Travers canton of Neufchatel, Seyssel in France, and Limmer near the city of

Hanover, and also at Hölle, in Ditmarchin and Bechelbronn in Alsace.

The term asphalt is sometimes improperly used to denote the natural bitumen or pitch, substances impregnated with bitumen, tar-macadam, or tar-concrete, a mixture of gravel, broken stone, and coal-tar, and pitches composed of artificially-mixed residuum oils of petroleum and naphtha, oil and animal fats, Stockholm and coal-tar. But true asphalt is a distinctive natural product, and may be described as "calcareous rock impregnated naturally with bitumen." The manufacturers take the lumps of rock, mined in the ordinary way, and reduce them to powder by means of machinery, screened, reground, and stored under cover. It is then heated in slowly-revolving cylinders at a temperature varying from 250° Fahr. to 280° Fahr., or at a slightly higher temperature in colder weather. The fire must be of coal or wood, as coke, for instance, injures the asphalt. The heating continues for a few hours, during which great care is taken to maintain an uniform heat, because if it be underheated the bitumen will not bind properly when laid, and if over-heated it will fuse.

This heating has for its object the removal of moisture and to obtain the best binding value. For heavy traffic the powdered form of asphalt has proved to be the best. It is laid in the powdered form in thicknesses varying from 2 in. to 3 in. thick, raked evenly, and rammed or tamped with hot irons of about 12 lb. weight, and whilst still warm finally rolled with a 10-ton roller to make the whole even.

For light traffic the mastic form has, however, now superseded the powder. As rock asphalts contain 5 per cent. to 10 per cent. of bitumen, an extra percentage of bitumen has to be added to give it a plastic form. The bitumen and powder are heated in a cauldron up to a temperature of 400° Fahr., after which it is run into moulds to cool. These flat cakes are then imported into this country, broken up, and again heated in the cauldron. From 5 oz. to 8 oz. of bitumen is then added along with 20 oz. to 40 oz. of clean grit; limestone or sandstone being used, or else granite chippings.

THE STRIKES AND EMPLOYMENT.

The figures published in the *Board of Trade Labour Gazette* furnish food for thought. They show an improvement in employment as compared with a year ago. The trade union returns show 3·3 per cent. unemployed as compared with 4 per cent. August, 1910. They also show a net increase in the results of changes in the rate of wages of 9,400*l.* per week, and these are two signs much relied upon as indicating a period of prosperity; yet, despite this, the strike demon overshadows everything, and during the month 100 new disputes were commenced, and the number of workpeople involved in current disputes was 373,615, or 184,507 more than in July, whilst the working days lost during this one month were 2,323,600. Up to the end of July 5,498,000 working days had been lost, so the total has now reached 7,821,800 working days. In the whole year 1909 but 2,560,425 working days were lost, although 1908 was a bad year with 10,632,656 working days lost through strikes. We have not the figures for 1910 before us, but the above statistics surely show that no industrial nation can prosper when improving conditions of trade are squandered and working days lost to this extent through industrial disputes. The 7,821,800 working days lost in the eight months of this year must represent a loss in wages to the working classes closely approximating 2,000,000*l.*

GOVERNMENT CONTRACTS.

The following tenders have been accepted during the past month by the Government departments named:—*Admiralty, Works Department:* Tar macadam for Dover—Messrs. Bristowe & Co., 20, Tothill-street, S.W.; works services, floating booms, and gates—Mr. J. T. Crampton, Albion Shipyard, Portsmouth; heating detention quarters, Chatham—Messrs. E. Deane & Beal, Ltd., 1, Arthur-street, East, E.C.; reinforced concrete jetty, Portsmouth—Messrs. H. Lovatt, Ltd., Darlington-street, Wolverhampton. *War Office:* Works services—erection of annexes, Somerset Barracks, Shorncliffe—Mr. J. T. Denne, Walmer, Kent; erection of barrack stores, Army Ordnance Establishment, Burscough—Mr. G. L. Descer, Everton-road, Liverpool; erection of bomb-proof shelter, engine-house, Pon Farm—Mr. J. Crockerell, Bulford Camp; erection of canteen, Dunree—Mr. R. Coulhoun, Londonderry; erection of fire-engine shed and vehicle shed, Preston—Mr. R. Holt, Badger-street, Bury; erection of stables for commanding officers, Bordon—Messrs. Martin, Wells, & Co., Ltd., Victoria-road, Aldershot; new drainage works, etc., Glen Parva Barracks, Leicester, and erection of reception station, Strensall—Mr. A. Robinson, Woodbine Works, Idle, Bradford; periodical works services at:—Blackdown and Deepcut, Bulford Camp, Chatham, Kildare, and Woolwich (2nd Division)—Mr. F. Holdsworth, Shipley, Yorks; Dublin (Portobello and Richmond Barracks)—G. Morrow & Sons, Clifton-street, Belfast; Millbank, London—Mr. M. McCarthy, Heidelberg, King's-avenue, Clapham Park, S.W.; Netley Hospital—Messrs. G. F Smith & Co., Eldon-street, Southsea; Norwich and Winchester—Messrs. Skevington Bros., Bateman-street, Derby; Warrington—Mr. D. E. Hutton, 7, Briggate, Shipley; re-crowning and repair of gas-holder, Royal Gas Factory, Woolwich Arsenal—Messrs. Newton Chambers & Co., Ltd., Thorncliffe Ironworks, near Sheffield; remetalling roads and parades, Ponsonby and Stewart Barracks, Curragh, and renewal of rough casting, Newbridge—Mr. T. O'Mahony, Fermoy, co. Cork; renewal of stable paving, Royal Pavilion Stables, etc., Aldershot—Mr. J. Crockerell, Stanhope Lines, Aldershot; repair and maintenance of War Department buildings, Landguard—Messrs. W. F. Blay, Ltd., Belford-grove, Woolwich; supply and erection of aeroplane shed, Durrington Down, Salisbury—Mr. W. Harbrow, South Bermondsey Station, S.E. *India Office, Store Department:* Bridgework—Messrs. Horsehay Company, Horsehay. *Crown Agents for the Colonies:* Bridge—Messrs. Thames Ironworks Company, Ltd., Canning Town, E.; bridgework—Messrs. The Horseley Company, Ltd., Tipton, Staffs; cement—Messrs. Associated Portland Cement Manufacturers, Ltd., 8, Lloyd's-avenue, E.C.; Messrs. Peters Bros., 72, Victoria-street, S.W.; Messrs. Wouldham Cement Company, Ltd., 35, Great St. Helen's, E.C.; steelwork, etc.—Messrs. William Bain & Co., Ltd., Lochrin Ironworks, Coatbridge; structural work—Messrs. The Horseley Company, Ltd., Tipton, Staffs. *Office of Works:* Builders' work—National Gallery of Scotland; reinforced concrete roofs—Messrs. Scott, Marshall, & Co., 2, St. Andrew's-square, Edinburgh; Somerset House, repository—Messrs. Galbraith Bros., Ltd., Camberwell Green, S.E.; drainage, Bushey House—Messrs. Dent & Hellyer, 35, Red Lion-square, W.C.; Chelsea Hospital—Messrs. John Peattie & Son, 3, Victoria-grove, Kensington, W.; forced circulation heating apparatus, Windsor Castle, Royal Gardens—Messrs. Mackenzie & Moncur, Ltd., Balcarres-street, Edinburgh; heating services, British Museum extension—Messrs. The Brightside Foundry and Engineering Company, Ltd., 28, Victoria-street, S.W.; National Gallery, west wing, and Patent Office extension—Messrs. Cannon & Hefford, Stanbury-road, Peckham, S.E.; hot-water service, Imperial College of Science—Messrs. The Brightside Foundry and Engineering Company, Ltd., 28, Victoria-street, S.W. *General Post Office, Engineering Department:* Electric lifts, West Central District Office, London, W.C.—Messrs. Medways Safety Lift Company, Rolt-street, Deptford, S.E. *Metropolitan Police:* Carrying out alterations at Kennington-lane Section House — Messrs. Prestige & Co., Ltd., Cambridge Wharf, Grosvenor-road, S.W.; erection of new station and stables at Plaistow—Messrs. E. Lawrance & Sons, Ltd., 15, Wharf-road, City-road, N.

GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, KINGSWOOD.

The various alterations and additions to this church have been carried out from the designs of Messrs. La Trobe & Weston, architects, of Bristol. The contract has been carried out by Messrs. Palser & Newton, builders, of Bath.

NEW CHURCH, PLYMOUTH.

The new church of St. Mary the Virgin is being erected at a cost of about 10,000*l.*, from the designs of Mr. T. R. Kitsell, architect. The builders are Messrs. Pethick Bros.

ST. JOHN'S CHURCH, CANONBURY.

A new reredos and some carved panelling have been placed in this church at a cost of about 260*l.*, and the panelling was executed in Austrian oak by Mr. A. Robinson, of Bloomsbury. Various other improvements have been carried out, including the remodelling of the electric-light installation. The architect for the work was Mr. J. C. Stockdale, of Bloomsbury.

NEW HIGH SCHOOL, WELLINGBOROUGH.

This school for girls has been erected from plans prepared by Messrs. Sharman & Archer, architects, of Wellingborough, and the builders were Messrs. Hacksley Bros. The sub-contractors were:—Messrs. Higgins & Sons (stone work), Mr. Jayes (plastering), Mr. Crisp (plumbing, painting, and glazing), Mr. Mansell, Northampton (electric lighting). The hot-water apparatus, Messrs. Marriott & Co.

NEW SCHOOL, RYHOPE.

This school has been erected at a cost of about 13,936*l.* from the designs of Mr. W. Rushworth, architect, and provides accommodation for 207 scholars. The contract was carried out by Mr. W. B. Cooper, of Sunderland.

GRAMMAR SCHOOL, WOLSINGHAM.

This new school has been erected at a cost of 11,337*l.*, and provides accommodation for about 160 scholars, with an assembly hall, holding 200 persons. The architect was Mr. W. T. Richardson, M.S.A., of Stockton-on-Tees, and the contract was carried out by Mr. T. Hilton, builder, of Bishop Auckland.

NEW SCHOOL, TEWKESBURY.

The estimated cost of the erection of this school is about 1,300*l.*, and the work has been carried out by Messrs. Collins & Godfrey, builders. The architect was Mr. R. S. Phillips, of Gloucester.

NEW SCHOOL, UPPERMILL.

With reference to the short paragraph under this heading in our last week's issue (page 310), an error was made in giving the name of Mr. Graham as the county architect. The plans for this school were prepared by Mr. John Stuart, the county education architect, and the work carried out under his supervision. Mr. Graham was the contractor for the works, and the clerk of works was Mr. H. Schofield

LOWESTOFT PAROCHIAL HALL.

A new Parochial Hall is being erected at Lowestoft in Alexandra-road. The contract for the building of the institute was 4,000*l.* Messrs. Mobbs Bros. have been entrusted with the building contract, the architect being Mr. H. C. W. Blyth, Lowestoft. St. Margaret's Parish Institute is designed in the late Gothic style, with a façade of red brick and bath-stone dressings. It consists of a hall on the first floor, 60 ft. by 30 ft. There are seven class-rooms opening on each side, with a platform at the end, retiring-rooms, and lavatories. On the ground floor are the institute rooms, billiard-room, reading-room, a small hall 36 ft. by 24 ft., choir practice-rooms, kitchen, guild and class-rooms, and a crush hall. It is a two-story building.

HALL, ST. ANDREW'S.

A large hall has been built for the quincentenary celebrations at St. Andrew's University, by Messrs. D. Mcandrew & Co., builders and contractors, Aberdeen. The hall is situated on the tennis courts behind the United College, and measures 225 ft. long by 90 ft. wide, and is seated for 3,500 people. The hall is roofed in three bays, the central bay having a span 50 ft. wide by 24 ft. high to the underside of the tie, and two parallel side bays each 20 ft. wide by 17 ft. high to underside of tie. At the west end of the hall the platform extends across the full width of 90 ft., and is 20 ft. wide, approached by three sets of stairs from the main level of the floor and with two exit doors leading from a platform to a corridor behind. At the east end of the hall there has been formed a band gallery, with a floor area 30 ft. by 15 ft., approached by a separate stair outside. A corridor 6 ft. wide extends from the east door the full length of the hall, terminating with a flight of steps to the platform. At the quadrangle entrance a cloak-room has been fitted up for 750 guests, and also a robing-room, 40 ft. by 20 ft. At the Scores entrance a cloak-room has been fitted up for 500 guests, and for the guests entering from North-street cloak-rooms have been formed in the Physics Laboratory and the Chemical Laboratory. The hall and corridors are lighted by electricity.

TRADE NEWS.

Under the direction of Mr. S. Clifford Tee, architect, 50, Moorgate-street, E.C., Boyle's latest patent "air-pump" ventilators and air inlets have been applied to the new Synagogue, Harringay, N.

Kent-street School, Portsea, has recently been fitted with a number of D. O. Boyd's hygiastic ventilating school grates, supplied by Messrs. O'Brien, Thomas, & Co., Upper Thames-street, London, E.C., and Excelsior Works, South Bermondsey.

In reference to the illustration which appeared in our issue for September 8, the fireplaces throughout the new building for the

King Edward Memorial Hospital, Ealing, were supplied by the Well Fire & Foundry Company, of Berners-street, W.

Messrs. The Tilbury Contracting & Dredging Company, Ltd., of Westminster, have been successful in securing a contract for the supply of some 200,000 cubic feet of freestone from their Walldean Quarries. This stone is required for the construction of buildings at the Naval Base, Rosyth, among which are the Pumping Station, the Power Station, the sub-Electric Station, and the Boat House.

The new electric theatre, Bournbrook, Birmingham, is being supplied with Shorland's patent exhaust roof ventilators, by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

PROJECTED NEW BUILDINGS IN THE PROVINCES.*

ABERDEEN.—Baths (10,500*l.*); Mr. W. Dyack, Surveyor, Town-buildings, Aberdeen.

Aberford (Yorks).—Chapel (4,000*l.*); Mr. H. A. Chapman, Prudential-buildings, Leeds.

Aldershot.—Drill hall; Mr. W. J. Snuggs, builder, Birchett-road, Aldershot.

Arbroath.—Proposed reconstruction of infirmary (8,000*l.*); the Directors.

Banbury.—Offices and additions to mills, Station-road, for Messrs. Clarke, Ltd.

Barry. — Training college for women (36,000*l.*); Messrs. Tether & Wilson, architects, Queen-street, Cardiff; Messrs. W. Thomas & Co., builders, Tresillian-terrace, Cardiff.

Broadford (Skye). — McKinnon Memorial Hospital (3,000*l.*); Mr. W. L. Carruthers, architect, 22, Queensgate, Inverness.

Buckhurst (near Hartfield, Sussex).—Residence; Messrs. Tubbs & Messer, architects, Railway-approach, Woking; Messrs. Drowley Bros., builders, Woking.

Cardiff.—Offices, Queen-street, for the Principality Building Society; Messrs. Habershon, Fawckner, & Co., architects, 14, Pearl-street, Roath, Cardiff.

Cardonald (Renfrewshire).—Four cottages, Lennox and Westfield roads; Mr. John Young, Lennox-road, Cardonald.

Chesterton.—Pavilion, Milton-road, for the Magdalene College Amalgamated Clubs. Extensions to works, Camford-street, for the Cambridge Scientific Instrument Company. Extensions to works, Garden-walk, for Messrs. Pollard & Co.

Clydebank.—Church; architect, care of the Trustees, Morison Memorial Church.

Coatbridge.—Additional premises for the Coatbridge Co-operative Society.

Coleraine.—Sixty-six houses (11,300*l.*); Mr. S. J. M'Fadden, architect, care of the Clerk, Coleraine Rural District Council.

Countess Weir.—Farm buildings (4,000*l.*); Messrs. E. H. Harbottle & Son, County-chambers, Exeter.

Crewe.—Chapel (5,000*l.*), in connexion with the convent in Nantwich-road.

Cwmbwrla (Swansea).—Proposed school; Mr. A. W. Halden, Secretary, Education Committee, Swansea Town Council. Three houses, Middle-road; Messrs. J. & F. Weaver, builders, Manselton Steam Joinery Works, Cardiff.

Dean Bank (Durham).—New church; Mr. J. R. Grossart, Durham-road, Finden-hill, Sacriston, Durham.

Downfield.—School (4,000*l.*); Mr. R. S. Phillips, architect, The Cross, Gloucester.

Dublin.—Repairs to baths and wash-houses, Tara-street; Mr. C. J. McCarthy, Architect, Dublin Corporation.

Dunfermline.—Laundry; Secretary, Dunfermline and West Fife Laundry, Ltd., 143, High-street, Dunfermline.

Earsden.—Picture theatre; Mr. R. T. Whiteharn, Whitley Bay, Northumberland.

Eccles.—Extensions to Eccles and Patricroft Hospital (5,660*l.*); Messrs. Hardman & Jones, builders, Devonshire-road, Eccles.

Edinburgh.—Nursing home, Chalmers-street (11,000*l.*); Mr. T. Duncan Rhind, architect, 28, Rutland-street, Edinburgh. Ice rink, Haymarket, for Messrs. John Swan & Sons.

Exmouth.—Police buildings (6,000*l.*); Messrs. Harbottle, architects, Queen-street, Exeter.

Gillingham (Dorset).—Swimming bath; Mr. W. J. M. Marrish, Wyke-road, Gillingham.

Gillingham (Kent).—Alterations to club and institute, Balmoral-road, for A. S. E. Club, Gillingham.

Glasgow.—Extensions to glass warehouse, Waterloo-street (2,500*l.*); Mr. John B. Wilson, architect, 92, Bath-street, Glasgow.

Govan.—Workshops for the London and Glasgow Shipbuilding Company.

Great Whyte (Hunts).—Four houses; Mr. A. J. Bateman, builder, High-street, Ramsey, Hunts.

Gwaelodywain.—Proposed school; Mr. T. G. Jones, Secretary, Education Committee, Monmouthshire County Council, Newport.

Halifax.—Conversion of premises, corner of Commercial-street and Cheapside, for the Bradford and District Banking Company.

Hayes.—Offices, etc., for the Gramophone Company.

Hebburn.—Offices and workshops, Messrs. Hawthorn, Leslie, & Co.'s shipyard; Messrs. Boyd & Groves, architects, Emerson-chambers, Blackett-street, Newcastle-on-Tyne; Messrs. Lowery & Sons, builders, Newcastle-on-Tyne.

Hednesford (Staffs).—Technical institute; Messrs. H. Dorse & Son, builders, King-street, Cradley Heath, Staffs.

High Springwell (Durham).—Villa (1,000*l.*); Mr. H. T. Gradon, architect, 22, Market-place, Durham.

Ilkeston.—School, Bennerley-street; Mr. H. T. Sudbury, architect, 36, Lord Haddon-road, Ilkeston.

Kirkmichael (Perthshire).—Extensions to school (2,200*l.*); Mr. Lake Falconer, architect, 27, Union Bank-buildings, Blairgowrie.

Lairdsland.—Additions to public school (1,800*l.*); Architect, care of the Kirkintilloch School Board.

Leigh.—Police officers' quarters; Mr. P. J. Sheldon, Surveyor, Essex County Council, Chelmsford.

Leominster.—Chapel, etc., at cemetery, Hereford-road; Messrs. Turford & Southwell, builders, Ludlow.

Liverpool.—Additions to Parkhill Hospital (1,050*l.*); Mr. J. T. Alexander, City Building Surveyor, Liverpool Town Council.

Lowestoft.—The following plans have been passed:—Mr. C. E. Critoph, four houses, Carlton-road; Trustees of Beaconsfield Club, Club House, Surrey-street.

Lurgan.—Fifty houses; Surveyor, Lurgan Urban District Council. (Architect to be appointed.)

Lytham.—Institute in connexion with St. Peter's Roman Catholic Church, Lytham.

Maesteg (Glam.).—Proposed Council offices; Mr. S. J. Harpur, Surveyor, Maesteg Urban District Council.

Mallaig. — Extensions to public school (2,100*l.*); Mr. James Falconer, architect, 4, Cameron square, Fort William.

Mansfield Woodhouse. — Adaptation of Wesleyan chapel and schools for public offices; Mr. F. P. Cook, Surveyor, Mansfield Woodhouse Urban District Council.

Mexborough.—Public baths (5,000*l.*); Mr. G. F. Carter, Rural District Council Offices, Mexborough.

Milnrow.—School (5,000*l.*); Mr. Ralph Littler, architect, 15, Ribblesdale-place, Preston.

Monkerton Pinhoe.—Extensions to farmhouse, also new farmhouse and six cottages; Messrs. Ellis, Son, & Bowden, Bedford-chambers, Exeter.

Murton (Durham).—Proposed house on Knaresborough Estate; Mr. G. Waterhouse, Surveyor, Easington Rural District Council.

Newcastle-on-Tyne. — Building, Market-street; Messrs. Anderson, Sons, & Hedley, auctioneers, Market-street, Newcastle-on-Tyne.

Newlands (Renfrewshire).—Nineteen cottages, Auldhouse-road; Mr. John Baxter, Woodhead-avenue, Kirkintilloch.

New Mills.—Shed for Messrs. Crowther, Bruce, & Co., Ltd.

Newport and Bedwellty (Mon.).—Police stations (3,600*l.* and 2,800*l.*); Mr. W. Tanner, Surveyor, County Hall, Newport, Mon.

Newtownards.—Reconstruction of post office; Messrs. J. A. Gordon & Sons, builders, Ann-street, Scrabo, Newtownards.

North Seaton, Throckley, and Emblethorpe.—Schools (2,600*l.*, 7,000*l.*, and 2,800*l.*); Mr. W. Crozier, County Surveyor, Shire Hall, Durham.

Paignton (Devon).—Alterations to school, Curledge-street (750*l.*); Mr. H. Drew, builder, care of Mr. J. F. Young, Secretary, Education Committee, Devon County Council, Exeter.

Paisley.—Additions to offices and stores, Hawkhead-road, for Messrs. Doulton & Co., Ltd.

Pengam (Mon.).—School (7,125*l.*); Mr. R. Jones, builder, Caerphilly.

Portadown.—Proposed eighty houses; Surveyor, Portadown Urban District Council.

Portsoy.—Extensions to public school; Mr. John Wittet, architect, 81, High-street, Elgin, N.B.

Portswood. — Extensions to car depôt (3,400*l.*); Mr. H. F. Street, Electrical Engineer, Southampton Town Council.

Princes End (Tipton).—School; Mr. E. Richards, Secretary, Education Committee, Tipton Urban District Council.

Rugby.—Enlargement of St. Marie's Schools (780*l.*); Mr. Rourke, builder, Lutterworth.

Scarborough.—Proposed extensions to the sanatorium (600*l.*); Mr. F. H. Reed, Clerk, Board of Guardians, Scarborough.

Seaham Harbour (Durham).—Enlargement of school (300 additional places); Messrs. J. A. L. Robson and A. J. Dawson, Joint Secretaries, Education Committee, Durham County Council, Durham.

Silksworth (Durham). — Enlargement of school (150 extra places); Messrs. J. A. L. Robson and A. J. Dawson, Joint Secretaries, Education Committee, Durham County Council, Durham.

Southampton.—Shelter, convenience, etc., Hollybrook Cemetery (475*l.*); Mr. J. A. Crowther, Borough Engineer, Southampton Town Council. Residence, "Fairhurst," Bassett; Messrs. Petter & Warren, architects, Church-street, Yeovil.

Southchurch.—Police officers' quarters; Mr. P. J. Sheldon, Surveyor, Essex County Council, Chelmsford.

Southend.—Parish hall (250 places), in connexion with St. Helen's Roman Catholic Church, Southend.

Southport. — Catholic school; Mr. Alf. Gilbertson, architect, 13, Harrington-street, Liverpool.

Stafford.—Proposed engineering works for Messrs. W. H. Dorman & Co., Ltd.

Staveley.—School, corner of Eckington and Barrow Hill roads; Mr. E. W. Small, Secretary, Education Committee, Derbyshire County Council, Derby.

Stockport. — Police station and courts (30,000*l.*); Mr. J. Theo. Halliday and Mr. C. Paterson, architects, Manchester and Stockport. Extensions to hospital, Dailstone-lane (9,800*l.*); Mr. W. B. Beattie, builder, Gradwell-street, Stockport.

Stoney Stanton.—Additions to premises for the Stoney Stanton Co-operative Society.

Sunderland.—Premises for Messrs. Craven & Speeding Bros.

Swansea.—The following plans have been passed:—Messrs. J. & F. Weaver, three houses, Middle-road, Cwmbwrla; Mr. Hopkin Williams, three houses, Mansel-road, Bonymaen; Mr. David Symmons, twelve houses, Neath-road, Plasmarl; Mr. Hyman, alterations to Olympic Skating Rink, Oxford-street; Mr. David Thomas, eight houses, Bohun-street; Mr. James Taylor, seven houses, Montery-street; Messrs. J. B. Jenkins & Sons, four houses, Bernard-street; the Secretary, Education Committee, Swansea Town Council, additions to St. Thomas's School; Mr. L. H. Brown, six houses, Jersey-terrace; Mr. Charles Gustavus, three houses and shops, High-street; Mr. William Coutts, bioscope hall, High-street; Messrs. Thornett & Chivers, warehouse, Cambrian-place. The following plans have been lodged:—Mr. W. J. Howells, five houses, Spencer-street, Brynhyfryd; Mr. Hopkin Williams, ten houses, Mansel-road; Chapel Trustees, proposed additions to chapel, Sydney-street, Brynhyfryd; Mr. John Thomas, four houses, Pentrechwyth-road.

Tranent.—School (5,000*l.*); Mr. P. Whitecross, architect, Prestonpans.

Tredegar (Mon.). — Proposed swimming baths; Mr. W. L. Roach, Surveyor, Tredegar Urban District Council.

Treorchy (Wales).—Congregational church and schools (3,000*l.*); Mr. W. Beddoe Rees, architect, 3, Dumfries-street, Cardiff.

Turton.—Additions to Vale Mill, for the Edgworth Spinning Company, Ltd.

Twickenham.—The following plans have been lodged:—The Estate Land and Houses, Ltd., cinematograph theatre, Richmond-road; Mr. F. J. Fisher, additions to "Duke's Head" public-house, Albion-road.

Uttoxeter. — Remodelling the Smithfield (2,662*l.*); Mr. M. A. Boswell, builder, Wolverhampton.

Valleyfield.—One hundred and ninety-two houses for the Fife Coal Company.

Walsall.—The following plans have been passed:—The Managers, additions to schools, John-street; Mr. S. Wilkes, additions to shops, Bullocks Fold, Bloxwich; Walsall Co-operative Society, Ltd., shop, etc., Wednesbury-road, Pleck.

Wells.—Extensions to Wells Blue School (2,000*l.*); Mr. J. A. Picton, architect, Bruton, Somerset; Mr. S. Wikham, builder, Bridgwater.

Whittle-le-Woods.—Institute; Architect, care of the Vicar, St. John's Church, Whittle-le-Woods.

Willington.—Twenty houses; Mr. J. H. Armory, builder, care of Willington Co-operative Society.

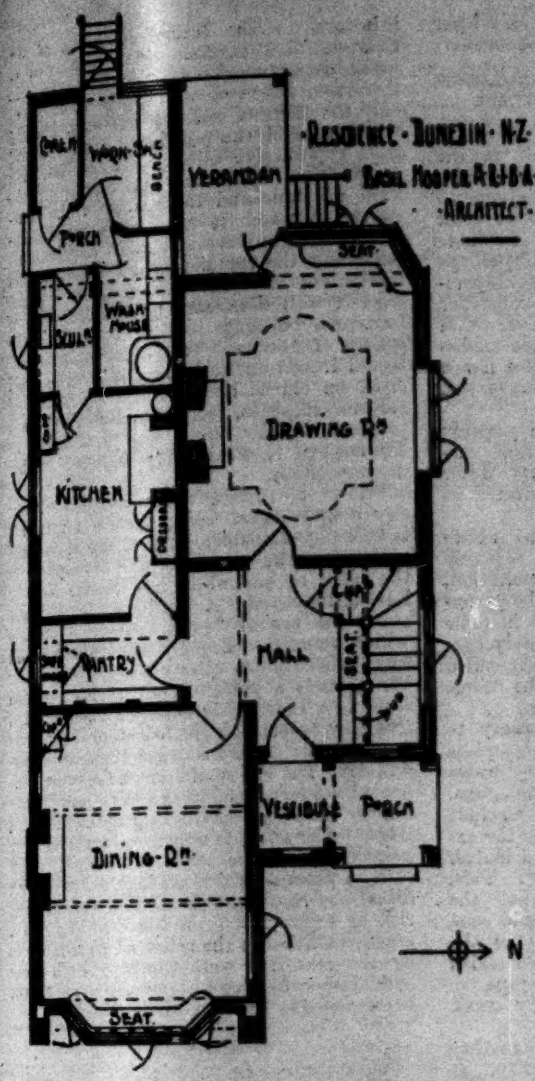
Winchcombe (Gloucester). — Additions to workhouse; Mr. H. W. Stephens, Clerk, Board of Guardians, Winchcombe.

Wokingham.—Proposed public baths; Mr. C. W. Marks, Surveyor, Wokingham Town Council.

Wolverhampton.—Additions to electricity generating station (6,000*l.*); Messrs. J. Cave & Sons, builders, Wolverhampton.

Yoker (Renfrewshire).—Church and hall rooms, Harvey-street, for the Kirk Session of the Yoker Parish Church.

* See also our list of Competitions, Contracts, etc., on another page



Residence, Dunedin, New Zealand.

Mr. Basil B. Hooper, A.R.I.B.A., Architect.

This residence is on a site only 35 ft. frontage, which, of course, materially influenced the plan. The walls are in hollow brick, rough cast, and the roof is covered with green American slates.

THE MISUSE OF STONE.

It is wrong to condemn a stone which has failed in a particular case without further inquiry into the circumstances of its use. Even in the case of building stones of undoubted reputation, it is a mistake to assume that one stone is as good as another for all purposes, and nothing has done more to injure the reputation of certain kinds of stone than the indiscriminate way in which they have been employed. In the selection of building stone too much importance is often placed upon such considerations as fashion, prejudice, convenience, or cheapness, to the entire neglect of the particular conditions under which stone is to be used and its suitability for the purpose in view.

In this respect specifications often leave much to be desired in clearness and precision of the terms employed. For example, Portland stone may be specified without distinction as to bed, although, as is well known, the Whitbed and Basebed have very different properties, the former being more durable for exterior work in large cities than the latter, which, in the absence of restrictions, the builder may for various reasons prefer to use. To specify Bath stone, also, without defining the quarry and even the bed from which it is to be taken is equally objectionable. The variability of stone is so great that general terms often mean very little, and loose specifications may be taken to be a fertile source of the misuse to which stone is sometimes put.

The use of various kinds of marble for external work in cities and manufacturing towns is another example of the need of discrimination, not only as regards the marble, but also as to the locality in which it is to be used. Experience is quite adverse to the indiscriminate use of this material. Marble fronts were very fashionable in New York in the early half of last century, but few have proved capable of resisting atmospheric action for any length of time. Some of the monuments in that city, constructed of Vermont marble, are now covered with moss and lichen. In London, notwithstanding some sad experiences, such, for example, as the front of the Tivoli Music Hall in the Strand, marble façades are still erected, and some excellent examples from Greek and Italian quarries have lately been built; while in Liverpool the experiment has been also tried, the results of which time will show. In some Continental cities, where the air is dry and clean, marble structures are more durable, and striking effects are obtained by its use when properly selected. Of this there are many examples, of which mention may be made of the beautiful white marble from Ekeberg, in Narke, used in Stockholm. It seems to be clearly established that only perfectly homogeneous marbles have any chance of withstanding the action of town atmospheres, and these must be of a compact, non-absorptive character. The pure white kinds, however, are generally more granular and softer than the blue and grey varieties.

The presence of other minerals than pure calcite or dolomite has generally proved disadvantageous. Tremolite marble has been tried in New York with bad results, the tremolite veins weathering out and disfiguring the stone by ugly fissures. Seams of talc have behaved similarly in the marble statue of Lincoln in front of the City Hall, Washington.

Breccia marbles and coloured varieties, such as Verde Antico, are liable to unequal weathering, and have not proved satisfactory for external use in an impure atmosphere.

A frequent cause of failure in building stone is the selection of too soft a material. Ease of dressing and working are too often the main inducements in such cases. Examples are innumerable. An instructive case is the failure of the soft Darley sandstone in various public buildings in Melbourne. For this reason this stone was rejected in favour of the harder and more compact white Stawell sandstone for the new Houses of Parliament in that city.

Bad Results due to Careless Quarrying.

However carefully a particular kind of stone may be selected, the material supplied is not always in accordance with the requirements. It was stated before the Commission appointed to inquire into the cause of the decay of the stone used for the Houses of Parliament that the stone supplied was quarried indiscriminately from all the beds in the quarry face. Instead of following the natural beds horizontally, the whole of the quarry was worked from top to bottom, and, although some softer beds were stated to have been rejected, there were noticeable differences in the nature of the stone delivered, which was determined rather by the size of the blocks than by their quality. The stone, moreover, was used without seasoning, and, even in the winter, was placed in position within a few days, or night after being quarried.

Careless quarrying can also affect the soundness of the stone, and the mischief thus caused may easily escape notice. The "ring" of a stone can be rendered dull by the use of explosives, showing that incipient flaws have been developed. No stone with obvious flaws or blemishes should be used in construction, but unfortunately these are sometimes concealed. Thus we have examples of Belgian marble in which clay veins have been raked out and filled with stopping. The failure of such stone, which is sure to take place sooner or later, is a condemnation not of the stone, but of the way in which it has been misused. In South African buildings there has been much carelessness in respect of the use of unsound stone, resulting in bad fronts, cracked sills and lintels, and gaping fissures, arising from the want of any supervision over the despatch from the quarry.

Dressing.

Masons often maintain that machine-worked stone is inferior in weathering power to hand-worked material. While some allowance should probably be made for prejudice against machine working, it is probable that the surface of stone is more likely to become "stunned" under the machine tool than by hand working. That a shattering of the superficial portion does to some extent take place may be proved experimentally. Sawn test pieces usually give higher results in abrasion tests than when these have been "picked" or hammer-dressed. It has been suggested that machine dressing should not be carried out to within more than ¼ in. of the finished surface, the last portion being worked by hand.

Although the practical importance of such a precaution may have been somewhat exaggerated, it seems to be established that the stresses set up by machine tools tends to weaken the cohesion of that part of the stone which is most accessible to weathering agencies.

Quarry Water.

Still more important is the question whether stone should be dressed in its "green" or in it seasoned state. Dressing stone on the job after seasoning in the quarry is believed by many to be a fertile cause of disintegration, since the protective "skin," said to be formed by the loss of quarry water, is believed to be thus destroyed. The practice has therefore been condemned by Viollet-le-Duc and other eminent authorities.

To understand the force of this contention it is necessary to know what takes place during the process of seasoning. There are several different views of this action. Some maintain that the hardening which many kinds of stone undergo on the loss of their quarry water is merely due to an increase of cohesion in the dry state, just as clay hardens on drying and becomes soft again when water is absorbed. Hermann* holds this view, and maintains that stone hardened by loss of quarry water becomes soft again if saturated with moisture. Upon this view the hardening produced by seasoning would depend upon increased granular cohesion alone without chemical action. When stone contains an argillaceous cement there may be a certain amount of truth in this explanation, but it does not represent the whole process in all cases.

Another theory more generally held is that on evaporation of the quarry water substances in solution are deposited in the surface layers of the stone, forming a natural cement which binds together the particles and closes the pores, thereby rendering the stone more compact and therefore less absorptive. At the same time, according to this view, the action is believed to be mainly confined to the surface, the interior of the stone being left unchanged except for an increase of granular cohesion due to drying. This theory implies, in fact, that chemical induration leads only to a kind of case-hardening. In support of this view we have Wadsworth's statement that the Potsdam sandstone and the St. Peter's sandstone of Wisconsin become compact quartzites on the outer crust, while the inside remains porous and friable,† a phenomenon which the writer thinks must be very exceptional.

Lastly, we have the view that chemical hardening due to the deposition of dissolved matter as a cement extends throughout the whole mass of the stone.

Unfortunately, there is little or no information respecting the chemical composition of quarry water or, as it is sometimes called, the "sap" of stone. This must depend largely upon the mineral composition of the stone itself. Mr. Barrow‡ explains the hardening of Millstone Grit quarried in Staffordshire, as the result of the slow decomposition of the fragments of felspar present in it, whereby alkaline silicates are formed and soluble silica is set free. The latter, on loss of water, furnishes a siliceous cement which binds the particles together. The process resembles the well-known case of the transition of felspar into kaolin, represented by the equation :—

$$\underset{\text{Felspar.}}{K_2O.\,Al_2O_3(SiO_2)_6} + 2\,H_2O + CO_2 = \underset{\text{Kaolin.}}{2\,H_2O.\,Al_2O_3(SiO_2)_2} + \underset{\text{Silica.}}{4\,SiO_2} + K_2CO_3.$$

Other felspathic sandstones, such as the New Red sandstones of Scotland, may also undergo a similar change on seasoning. In cases where felspar is not present, however, it is necessary to assume the presence of soluble salts from other sources, of which perhaps ferrous carbonate is one of the most important. The cementinga action of this substance is due to the fact that hydrated ferric oxide would be produced on exposure to the oxidising action of the air. This substance has a well-known influence upon the hardness and strength of clays.*

In a similar way limestones would possibly harden by the deposition of calcium carbonate held in solution in the quarry water as calcium bicarbonate, and precipitated as calcite in the pores of the stone.

While some such reactions as the above would explain the hardening of stone as a true chemical alteration, resulting in cementation, and, therefore, quite different from the granular adhesion theory, we are still left in some doubt as to whether the action is mainly confined to the outer surface, forming a so-called "skin," or whether it permeates the whole mass.

To solve this problem it is necessary to understand the physical processes taking place during the evaporation of the quarry water from the exposed surface of a mass of stone. At first sight it seems reasonable to conclude that, as evaporation only proceeds at the exposed surfaces, deposition of dissolved matter would be confined to that portion. This, however, involves the difficulty that the formation of a superficial "skin" would soon hinder further evaporation. A part of the quarry water would thus become either sealed up in the stone or would only escape so slowly that seasoning, in the ordinary sense, would seldom be complete.

It seems probable, therefore, that another principle comes into play, i.e., capillarity. It can be shown that when salt solutions pass through capillary tubes salt is deposited on the walls of the tubes, owing to the effects of surface tension. The solution thus becomes continually less concentrated until finally pure water alone is transmitted. A simple experiment can be made to illustrate this process. A drop of solution of potassium permanganate placed upon blotting-paper shows concentric rings of diminishing concentration as the solution penetrates wider areas.

If this theory holds in the case of salt solutions permeating the capillary pores of stone, instead of the concentration increasing towards the superficial layers it will tend to diminish as the rock pores are traversed, and dissolved matter will be thus deposited throughout the entire mass. Seasoning would then result in a chemical induration of the stone throughout, and not in the superficial layers only.

The present writer has failed to find evidence of the existence of any definite "skin" in seasoned stones examined by him. The compressive strength of seasoned stone, in cases where considerable hardening takes place in the process, even when again saturated with water, is generally considerably higher than that of the same stone in a "green" condition, and mere case-hardening is insufficient to explain the difference.

At the same time, building stones differ greatly in the amount and nature of the quarry "sap," and in the degree of hardening which they undergo on seasoning.

On the whole it seems probable that the plea for dressing stone before seasoning has taken place rests mainly upon the fact that it works more easily in that state, and the "case-hardening" theory appears to break down upon investigation. There is also a positive objection to quarry dressing in the case of some kinds of stone, owing to the ease with which the arrises may become chipped during transit.

Closely connected with the subject of air hardening of stone is the question of resurfacing worn stonework. It is generally held almost as an axiom that the use of the sand-blast or the "drag" for this purpose is highly injurious to the future durability of the building, and examples have been cited of rapid decay resulting from this cause. In this case, however, we have to consider not only the effect of ordinary seasoning, but also the nature of the weathered crust resulting from exposure to atmospheric agencies. The composition of this crust varies much with the kind of stone and the nature of the atmosphere to which it has been exposed. The existence of any crust at all is largely determined by the rapidity of its formation and the extent to which it is removed by rain. This is well illustrated by the behaviour of limestone buildings in the sulphurous atmosphere of London. Where the stone is protected from rain wash there is a well-defined crust on old buildings, consisting mainly of calcium sulphate, which undoubtedly has a protective action upon the parts below it. To remove it would only facilitate further decomposition.

Where the surface is only corroded without any definite crust being formed, resurfacing is still objectionable, since it exposes a fresh surface to the attack of the atmosphere in the place of one which has become more or less acclimatised. A word may be said here about the use of "green" stone, a practice which must be strongly condemned in all cases where much quarry "sap" is present. Wren made a point of having his Portland stone in a thoroughly seasoned condition, and this may account for the fine state of preservation of many of his London churches at the present day. The bad results which follow from the use of "green" building stone are largely due to the action of frost upon the saturated stone. The effect is sometimes aggravated by painting the stone while the "sap" is still in it, a practice which has been followed with disastrous results in the United States. The risk of exposing certain kinds of stone in a green condition to the action of frost is shown by the fact that some kinds of Bath stone and also of Connecticut brown stone cannot be seasoned in the open air in winter.

Natural Bed.

Notwithstanding the mass of existing evidence of the bad results which follow from face-bedding in the case of stone of sedimentary origin, there are still some who deny the importance of placing stone in the building in such a position that it rests upon its natural bed. Violation of this principle is responsible for a great many failures. Conspicuous examples have been cited from New York and Philadelphia, where brown stone has been much used in the form of thin slabs cut parallel to the natural bedding planes, and used as a kind of veneer or facing for buildings. The action of frost upon such slabs is to cause flaking and rapid deterioration. It has been stated that 20,000*l.* have been spent in repairs, due to setting stones on edge, in the case of Holy Trinity Church, Brooklyn, alone. In almost any large city similar examples of flaking along the bedding planes can be studied. A typical case may be seen in some of the red sandstone pillars in front of the Law Courts, Strand, London. Pillars should always be cut so that the natural bed of the stone is at right angles to the axis of the column. Where this rule has not been observed, and the bedding planes are parallel to the axis, flaking is likely to occur. It often happens that the height of the columns will not allow them to be cut transversely to the bedding planes. Slabs for tombstones, also, or for facing work are more readily cut parallel to the bedding. The evil effects of flaking in such cases cannot be overcome by making the slabs thicker, since whatever be their thickness the exposed outer layer is a source of weakness. Even when there is no apparent lamination, there are generally planes of weaker cohesion parallel to the bedding due to faint streaks of earthy matter or other causes, such as the presence of mica in definitely-oriented flakes. On this account all stones should have the position of the bed clearly marked at the quarry, particularly when it cannot be otherwise easily detected. This is regularly done in the case of some stones, as, for example, Bath stone, but it is in other cases made the subject of commercial boasting that particular stones have no bed, a statement always to be regarded with suspicion in regard to stone of sedimentary origin. Bedding which is indeterminable in the unweathered block is too

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* Hermann. "Steinbruchs Industrie und Steinbruchs Geologie," p. 123.

† "Proc. Boston Soc. of Nat. Hist.," XXII., p. 202 (1885).

‡ "Mem. Geol. Surv., North Staff. Coalfield," p. 227 (1905).

* Senft. "Die Tonsubstansen," pp. 21, 22.

often rendered conspicuous by the action of frost.

In the case of certain marbles, which are so highly metamorphosed that all bedding structures are obliterated, it is possible that little harm may be done by setting on edge, but where mica foliation is present such a course is likely to prove disastrous, as was the case with some of the older beds of Pentelicon marble from which the ancient Greeks cut columns obliquely to the mica layers, with a resulting loss of strength, while columns cut from the micaceous Bunter sandstone of the Black Forest without regard to this principle, have failed conspicuously from this cause. Even crystalline rocks, such as gneiss, with pronounced mica foliation, have flaked badly in New York when set on edge. On the other hand, Merrill has examined many buildings in which Cockeysville marble has been set on edge without evil results owing to its extreme uniformity in texture in every direction.*

Where weight has to be carried the presence of oblique lamination produces glide planes, which are especially to be avoided even in covered structures not exposed to the danger of flaking by frost.

The matter is further complicated when false or current bedding is present. It is then quite impossible to avoid the existence of glide planes. For example, in the New Red sandstone of Scotland it is not uncommon to find current bedding at angles as high as forty to the true bedding; but the bad effect in such cases may be almost negligible in a well-cemented rock, as may be seen in Nuremberg, where much current bedded material has been used. Similarly, a pronounced current bedding appears on weathering in some of the hard white sandstones used in Melbourne—such as the Stawell stone and Dunkeld stone, without any serious ill-effects; but the Table Mountain sandstone, of Silurian age, used occasionally in Cape Town, splits badly in all directions owing to this cause.

Although, as a general principle, all stone should be set with the natural bed perpendicular to the pressure—that is, in most cases with the bedding planes in a horizontal position—there are occasions when these should be vertical. Thus, in overhanging undercut cornices, or in projecting string courses, the bedding planes should be vertical and run from front to back, *i.e.*, at right angles to the face of the building, in order to avoid the risk of flaking. The same applies to copings and to other positions in which stones are exposed on the upper and under surfaces and carry but little weight. Gothic tracery, also, is generally more durable if face-bedded, because the cusps are in so many directions that this is the only way to prevent the planes of lamination from crossing the points and causing them in time to split off. In arches the bedding should be at right angles to the direction of thrust. The practice of edge-bedding stone in order to show the pattern sometimes displayed on the bedding-planes, as in the case of some Connecticut brown stones, is not to be recommended, and has generally led to rapid deterioration owing to flaking. Another objectionable practice is to dress stones with a hollow bed in order to secure close jointing. The result is that the weight is then carried solely on the edges, instead of being distributed over the whole bed, and spalling is then liable to take place. Similar methods have been followed in the case of columns, with the result that even granite piers have cracked under the load upon them. The piers of Holborn Viaduct have been quoted as a striking example of this mistake.

Effects Due to Embedded Metal.

The rupture of stone by included iron has been frequently described. This effect has been recently studied in detail by M. G. Denil,† who has examined many cases in which stone posts have been broken by fixing in them iron rails, cramps, dowels, etc. He has attributed these fractures to the following causes:—

1. Rupture, owing to concentrated load, as on bridge piers.
2. Fracture by expansion of the included metal.
3. Fracture by frost, owing to infiltration of water into badly-sealed iron fixing.
4. Fracture, owing to badly-worked holes to receive metal fixings.
5. Fracture by expansion, due to rusting of included iron.

To avoid these results, he recommends that only pure lead should be used for sealing. Portland cement and sulphur should be avoided. Iron is bad for cramps and dowels, owing to the effects of oxidation, which not only causes staining, but also results in expansion and splitting of the stone. Gavlanised-iron is better than ordinary iron, and bronze is better than either. For fixing marble slabs copper cramps should always be used.

Errors Due to Position.

Certain parts of a building are especially susceptible to atmospheric disintegration. Staining is often the result of water running down a wall owing to bad construction. Atmospheric action often begins in masonry beneath cornices and projections. For this reason all cornices, sills, and projections should be "weathered," that is, inclined so that water runs off, and the softer the stone the steeper should be the inclination, reaching in extreme cases to one in ten. Otherwise the top should be covered with sheet lead. The undersurface of projections should be "throated" to prevent water from running back to the wall. Inattention to these details has often led to speedy disfigurement of a façade.

Special conditions are also worthy of notice, such as may be observed in the doorway of the exit from the Central Low Level Station, Hope-street, Glasgow, which is in the path of the acid-laden air from the railway, and has suffered marked disintegration. In damp situations walls should not be built with porous stone. Hollow walls are an advantage in such cases. Neglect of this precaution has been a fruitful source of disintegration of buildings in Egypt, in a climate particularly favourable to durability. Mr. A. Lucas has called attention to the serious decay in buildings near the ground level in Cairo, owing to absorption of saline ground water, which on evaporation from the surface of the stone leaves a deposit of salts, not only as an efflorescence on the surface, but also within the pores of the stone, and leads to flaking owing to the expansive force of crystallisation.* An efficient dampcourse is a remedy in such cases; but in engineering work, such as bridges subjected to a fluctuating

* "Maryland Geol. Surv.," II., p. 178 (1898).

† "Annales des Travaux Publics de Belgique." December, 1910.

* "Disintegration of Building Stone in Egypt." Cairo, 1906.

Window in St. Ann's Church, Manchester.

This window was designed by Mr. Arthur A. Orr and executed by Mr. Rueben Bennett, Manchester. Our illustration is from a drawing exhibited at the Royal Academy this year.

water level, the use of non-porous stone is essential.

In some climates damp situations may cause decay even when salts are absent, owing to the influence of frost. Thus in hydraulic works the neighbourhood of the waterline is generally the first part to show decay in countries where the temperature falls below freezing-point.

Damp walls may produce still more insidious effects. Thus marble slabs have been ruined by fixing them against newly-built walls. The surface becomes pitted with small holes, especially when the stone is face-bedded. It is advisable never to fix marble slabs solidly to the wall, but to leave an intervening air space. Even a backing of green wood has led to staining from absorption of sap by the marble.

Instances could be multiplied indefinitely, but the above examples are enough to show how the wearing properties of stone may be injured by misuse.

ARCHITECTURE AND SCULPTURE AT SOUTH KENSINGTON

SIR CECIL SMITH'S report, issued by the Board of Education, contains some interesting references to recent acquisitions for the Victoria and Albert Museum. The increased valuation placed on all works of art in recent years makes more then ever welcome such bequests as those by George Salting and Captain Murray. Special thanks are due to Mr. Fitzhenry for contributing to the permanent features of the "Department of Architecture and Sculpture," as it is now called. In 1909 he presented a handsome wooden staircase from a house at Morlaix, in Brittany; it is French work of about 1500. This fine stair, which must have stood in the corner of a courtyard, is spiral in form, and has galleries and landings for three floors. The principal feature is a tall column, elaborately carved with figures, shields, leafwork, and imbricated ornament, and surmounted by a statuette of St. John the Baptist; the balustrades springing from this column have linenfold panelling. This interesting type of staircase is apparently peculiar to the town of Morlaix. Mr. Fitzhenry presented also a well-head of orange-coloured marble, dating from the first half of the XVth century, bearing on one of the sides the arms of the Concoreggio family of Verona, and a XVth-century Venetian sarcophagus of carved limestone, said to have come from the church of St. Giobbe, at Venice. Three XVIIIth-century marble fireplaces were presented by Mr. J. A. Dolmage. In 1910 a series of doorways and other architectural details, mainly in wood, were presented by H.M. Office of Works; these date from the XVIIIth century —mainly from the last quarter—and were obtained from houses demolished in the early part of the year in Great George-street and Delahay-street. The gift is particularly acceptable, as doorways of this class are perhaps more continually measured and studied by architectural students than any other exhibits in the department. Mr. J. H. Fitzhenry presented an interesting relief of the Virgin and Child in painted stucco, the work of a Florentine artist of the first half of the XVth century. Other work by cognate sculptors, sometimes gathered together under the name of the "Master of the Pellegrini Chapel," is already exhibited in the Museum; but this relief (of which there is a replica in the Kaiser-Friedrich-Museum at Berlin) is an example of a particular group hitherto unrepresented. Mr. Fitzhenry has further presented a collection of architectural details, mainly classical Roman work, in stone and terra-cotta, but including Romanesque capitals, etc. Another gift was that of three Japanese architectural models—the Belfry of the Tōdaiji at Nara, the Tahō-tō (great pagoda) at Daidenbo-in, and the Hi-un-kaku (pavilion) at the Nisbi Hongwanji, Kyoto, presented by Mr. H. Yamawaki on behalf of the Imperial Commissioners of the Japan-British Exhibition.

The Salting Bequest.

The magnificent bequest made by the late Mr. George Salting enriched the department in several directions; by far the most important, both absolutely and in relation to the collections previously possessed by the Museum, being that of Italian bronzes. The bronzes in the Salting Bequest (altogether about 120) do not, indeed, put the Victoria and Albert Museum on a level numerically with some of the great collections on the Continent; but many of the new acquisitions are of the finest possible quality, and almost all are of unimpeachable authenticity. Perhaps the first place in historic importance and artistic merit would be taken by the bronzes of the Paduan school, which are grouped round the name of Andrea Briosco (1470-1532) better known as Riccio. The Paduan workshops produced a very great number of bronzes, especially decorative objects, and the name of Riccia must often be taken rather as indicating a place and period than a single artistic personality. But the two magnificent sphinxes, replicas of those at the lower angles of the great Paschal candlestick in St. Antonio at Padua, may be ascribed with confidence to the master's own hand. Another school of bronze-workers well represented in the bequest is the Florentine. The influence of Donatello himself may be traced in the beautiful little bell, decorated in low relief with a band of dancing children and surmounted by a boy beating a tambourine for a handle, though it must have been made after the master's death in 1464. Bertoldo di Giovanni, the pupil of Donatello and master of Michelangelo, who died in 1491, was very probably the maker of the large Hercules; with which may be compared another smaller figure of the same deity slaying the Nemean lion, and perhaps the curious circular plaque with an allegorical relief of architecture. The group of Adonis and his dog has been assigned to the school of Andrea del Verrocchio; the Moses (2623) is an almost contemporary copy of the colossal marble statue by Michelangelo which forms part of the unfinished tomb of Pope Julius II. in St. Pietro in Vincoli at Rome. The most important works by Giovanni da Bologna (1529-1608), who may be reckoned among Florentine artists, although born at Douai in French Flanders, are the group of Nessus and Deianira, the fountain-figure of Venus, and the large Rape of a Sabine woman, the latter one of the finest bronzes in the collection, and one of the first which Mr. Salting acquired. The Venetian and other North Italian schools are mainly shown in small figures and decorative objects, such as a singularly graceful candlestick ascribed to Leone Leoni (1509-1590), an inkstand with a kneeling warrior, and a small six-sided fountain.

The medals and plaquettes in the Salting Bequest have been grouped with the bronzes in the Department of Architecture and Sculpture for purposes of arrangement. The medals form a carefully-selected series of about 250, generally in fine condition, and are a most valuable addition to the specimens already in the Museum. Among the Italian medallists Antonio Pisano of Verona, better known as Pisanello, is represented by six medals:—Leonello d'Este, Lodovico Gonzaga, Sigismondo Pandolfo Malatesta, Malatesta Novello, John Paleologus, and Niccolo Piccinino. By Matteo de' Pasti, also of Verona, are four medals:—Leon Battista Alberti, Sigismondo Pandolfo Malatesta, and two of Isotta Atti, his wife. Six medals bear the signature of Sperandio, the great medallist of Mantua:—Andrea Barbazza, Giovanni Bentivoglio II. of Bologna, Lodovico Brognolo, Lodovico Carbone, Federigo Montefeltro, Duke of Urbino, and Francesco Sforza. The portrait of the famous Sultan and conqueror of Constantinople, Mahomet II., is given on three medals, by Bertoldo di Giovanni, Costanzo, and Gentile Bellini. The medal by the first-named is one of the finest specimens in the collection, and is in a wonderful state of preservation.

The bequest made by the late Capt. H. B. Murray includes sixty-four objects falling within the scope of the Department, mainly small carvings in wood and ivory. One acquisition of particular interest is a large XVIth-century South German figure of Christ riding on the Ass, a "Palmesel" used in churches in the Palm Sunday procession. The bequest also contains two fine French XVIIIth-century pillars in marble and gilt bronze, a number of netsuke, and six Chinese cups carved in rhinoceros horn.

Purchases for the Museum.

Beyond question the most important of the acquisitions by purchase during the year has been that of two life-sized recumbent effigies of white marble by a Spanish sculptor of the second half of the XVth century. These figures, which represent Don Rodrigo de Cardenas, a knight of the Order of Santiago who lived in the reign of King Henry IV. of Castile (1454-72), and his wife, Teresa de Chacon, were formerly in the church of St. Pedro at Ocaña, a little town ten miles to the east of Aranjuez. The knight is represented in full armour, wearing the mantle and badge of the order of Santiago and holding his sword; Dona Teresa appears to be in widow's dress and holds a rosary. Only second in interest to these magnificent sepulchral figures is the marble bust of King Charles I., signed by Hubert le Sueur (1595-1650), and dated 1631; two years earlier than the same artist's famous equestrian statue of the King at Charing Cross.

THE MANOR AND THE BUILDING OF MARYLEBONE

LORD HOWARD DE WALDEN is about to frame a scheme for dealing with his property in Marylebone, so as to give his tenants a permanent holding instead of the customary London leases. Formerly known as the Portland Estate, the property, which represents the ancient Tyburn, since 1410 Marylebone Manor, is divided into two portions by the Crown lands of Regent's Park. The smaller portion, to the north, lies within the confines of Park and Wellington roads, Cochrane and Henry streets, and Acacia and Townshend roads.* It was built over in the early years of last century; the Tyburn flowed through its south-eastern corner. In the glamour of their newly-rebuilt High-street and the huge pile of North Gate flats, the inhabitants contemn the good and significant name of Portland Town. The larger portion, about 200 acres, lies within the confines of Oxford-street, Marylebone-lane, Blandford and Northumberland streets, Cleveland, Union, and Wells streets, Adam and Eve-court, and Marylebone-road.* A plan of 1708, drawn by John White the younger, shows this portion as consisting of the little village with its church, taverns, and bowling-greens in the north-western corner, and the wide open area known as Marybone Fields plotted into several measured parcels—the resort of pugilists, swordsmen, and cudgel-players. John Price's designed plan of 1719 is entitled, "A Design of Buildings already begun to be Built in the parish of St. Mary la Bonne, Belonging to the Right Honble. Edward Ld. Harley and the Right Honble. Lady Henrietta Cavendish Holles Harley, A.D. 1719." A beginning was made with Oxford, since Cavendish, Square in 1717. Morden and Lea's map shows that by 1732 had been built only Cavendish-square and the streets within Oxford-street, Marylebone-lane, New Cavendish-street, and Great Portland-street, but nothing directly north of Cavendish-square, on the north side of which the Duke of Chandos had intended to build, after John Price's designs, a lordly mansion with a private road to Canons. In 1739 there were, *teste* Maitland, 577 houses in the whole parish, and thirty-five persons who kept coaches. James Gibbs built St. Peter's, in Vere-street, the (old) parish church in High-street, and Oxford Market (pulled down in 1880 for Oxford Mansion). The brothers Adam built Portland-place, and followed out Price's plans to the north and north-west of Cavendish-square. Nash made alterations for his All Souls' Church, Langham-place, Regent-street, and Oxford Circus—see our article, with plans and illustrations, of January 2, 1904, "Regent-street and Nash's Improvements. . . ."

In King Edgar's day the Abbess of Barking held Tyburn of the King; the descent is traced to Thomas Hobson, who exchanged it to Henry VIII. in 1544, and to Edward Forset, who bought it of James I. for 829*l.* 3*s.* 4*d.*, Marylebone (Regent's) Park being reserved for the chase by the King. Arabella Forset brought it, in marriage to Thomas Austain, their son sold it for 17,500*l.* in 1706 to John Holles, Duke of Newcastle,

* These limits, Oxford-street, Marylebone-lane, and Park-road excepted, are approximate. The boundary lines are too tortuous to be precisely described here.

whose daughter and heir, Henrietta, married Edward Harley, second Earl of Oxford and Mortimer. Harley's only daughter and heir, Margaret, married in 1734 William Bentinck, second Duke of Portland. Lucy, sister and co-heiress of William, fifth Duke of Portland, married in 1828 Charles, sixth Baron Howard de Walden.

LEGAL COLUMN.

Liabilities of Householders.

THE case of Barker *v.* Herbert, which we noted in the Court below (the *Builder*, March 25), has now been carried to the Court of Appeal, and the judgment has been affirmed. The case is one of importance to householders, as, if the plaintiff had succeeded, it would have imposed a very serious liability on owners of property. The defendant was the owner of a vacant house, which had an area fenced off from the highway by railings in the usual way. Some boys playing football broke one of the railings, and three days later a child crept through the gap and climbed along the parapet, from which it fell and was injured. The jury found that the area with this injured railing was a nuisance, and it was contended that this finding alone was sufficient to render the defendant liable.

The Court of Appeal negatived this contention, which would amount to an assertion that the owner of property warrants the world at large that there shall be no nuisance on his property, however and by whomsoever caused. The liability seems, according to the judgments delivered in the Court of Appeal, to be limited to nuisances caused by the owner, or by some person for whom he is responsible, and nuisances acquiesced in by him. There is also the more doubtful liability for acts of persons on the premises by permission, such as tenants; but this latter consideration did not arise, as in this case the cause of nuisance was created by a trespasser. The findings of the jury had also disposed of any acquiescence on the part of the defendant, since they had found that the defendant did not know that the railing had been removed, and that sufficient time had not elapsed for him to discover its absence by reasonable care.

It is not necessary to refer to a further finding of the Court that the nuisance was not the cause of the accident, because the child had passed through the gap in the railings and was climbing on the ledge inside them when he fell.

This case has been tried twice, having once been sent back for a new trial, and on the second trial the latter point was the ground of the decision; but it is satisfactory now to have a decision of the Court of Appeal negativing the serious responsibility endeavoured to be thrust upon householders by the other legal pair. Lord Justice Farwell, in speaking of the absolute liability contended for on behalf of the plaintiff, said: "This construction overlooks a fundamental principle applicable to questions with regard to the responsibility of landowners, namely, that there is for this purpose a distinction between the normal and abnormal use of land. In London, and in other towns in England, hundreds of thousands of houses are built with areas fenced off from the street by railings." This was not a case where the owner, for his own purposes, had left his land in an unusually dangerous condition, or had erected an unusually dangerous structure, or one out of the ordinary building line, as, for instance, a lamp overhanging the street.

LAW REPORT.

Builders' Test Case.

AT Wood Green Police Court recently there was a test case, which will doubtless have its effect upon builders and employers of labour throughout the country. A workman claimed wages, but having regard to the bad workmanship, the builders refused to pay him. The firm in question was upheld by the Wood Green Justices, who dismissed the case.

The defendants were Messrs. F. & T. Johnson, builders, of Truro-road, Wood Green, and the plaintiff was Alfred Waller, of Dagmar-road, Wood Green, who claimed 16s. 6d. as wages.

Mr. H. Morgan-Phillips appeared for the defendants, a well-known local firm of builders.

Complainant, a paper-hanger, stated that he was engaged by the defendants to do paper-hanging for them in one room of a house. He did twenty-two hours' work, the agreed wages being ninepence per hour. When he went for his wages on the Saturday, no money was forthcoming. He saw one of the partners, who refused payment, because, he said, the work was improperly done.

Cross-examined, complainant said he had been in the trade thirty years. No arrangement was made that he should be paid per piece of paper hung.

Mr. Morgan-Phillips, addressing the Bench, said it was not the amount of money in dispute at all, but it was a case of principle. It often happened that builders engaged men to do work, and albeit it was not done satisfactorily, yet the employer, through the smallness of the amounts, preferred to pay. Mr. Frederick Johnson (one of the partners of the firm), and a clerk, would tell the Bench that complainant was engaged to do the work at so much per piece. When Mr. Johnson called to see the work, he found it badly butted, the paper was dirty in parts, it was torn in several places, and round the electric bell switches it was so badly cut that small pieces were stuck on to make it look at all presentable. The firm had a reputation to maintain, and if work of that description were permitted, they would not be likely to get another order from the customer so treated. The consequence of the complainant's bad workmanship was, that they had to have the walls stripped again and fresh paper put on by a competent man. The defendants had really good grounds for a counterclaim, but they had no desire to appear in any way harsh.

Mr. Frederick Johnson said he engaged the defendant to paper a room in a high-class residence at Hampstead, and, before doing so, he questioned him closely upon his capabilities. He assured him of his ability, and he agreed to pay the usual rate per piece. Two days after he started work, witness visited the room and found the paper very badly hung, and he cautioned the defendant. He admitted three hours' work for lining done in another room, which was included in the claim; but the remainder he disputed. Witness received a letter from the architect for the owners of the house, who stated:—"I find the wallpaper is disgracefully hung, and regret to tell you I cannot accept it." Witness therefore had to find another man to repaper it, which cost 30s.

The defendants agreed to the payment of the 2s. or 3s. for the lining admitted to be done, and on this understanding the magistrate dismissed the summons.

METROPOLITAN ASYLUMS BOARD.

AT the sitting of the Metropolitan Asylums Board on Saturday, last week, an order was received from the Local Government Board authorising the managers to make alterations and additions to the Belmont Workhouse, at a cost not exceeding 2,855*l*. The following tender was also accepted:—For the erection of a steward's house at the Western Hospital, Messrs. Leeder & Co., 96, High-road, Chiswick, 673*l*.

LONDON COUNCILS.

Bermondsey.—Plans have been passed for Mr. J. D. Larkin, 166, Bermondsey-street, S.E., for a tannery in Upper Russell-street, also for Mr. R. L. Curtis, architect, 11 and 12, Finsbury-square, E.C., for school buildings, George-row, for the Trustees of the Roman Catholic school, Dockhead.

Bethnal Green.—Plans submitted by Mr. E. Goldie, for a Roman Catholic church at the corner of Old Ford-road and Victoria Park-square, have been passed.

Fulham.—Plans submitted by Mr. T. J. Evans, on behalf of Mr. F. N. Vivian, for one-story shops in North End-road have been passed. The Council have also decided to raise no objection to the application of Mr. F. J. Barrett, on behalf of the Army and Navy Auxiliary Co-operative Society, Ltd., for consent to the erection of buildings in Gonville-street.

Greenford.—At the last meeting of the District Council it was decided to engage Mr. Abbot, Surveyor to Ruislip District Council, to assist and advise the clerk upon various technicalities in connexion with a town-planning scheme, which the Council have agreed to adopt. It was further decided to authorise the clerk to take any necessary steps in connexion therewith, and to write to the Hanwell, Southall, and Uxbridge Councils, asking if such Councils would co-operate with the Greenford Council.

Hammersmith.—The Works Committee report having been in communication for some time past with the Ecclesiastical Commissioners upon the subject of making up and paving Old Oak-road, between Armstrong-road and East Acton Green, with a result that an agreement is now being prepared, on behalf of the Commissioners, for Messrs. Clutton, to make up this road, provided that, upon completion, the same shall be taken over by the Hammersmith Borough Council and the Acton Urban District Council respectively. Plans were also in course of preparation with a view to the work being put out to tender when the plans, etc., had been approved by all parties, and the agreement concluded. The Committee have decided to pave the carriageway of Wells-road with asphalt macadam at an estimated cost of 351*l*., and the London General Omnibus Company, who are the principal users of this road (having a garage therein) have undertaken to contribute 175*l*. towards the cost. A granite sett apron is to be laid in front of the garage. The Borough Surveyor has been instructed to prepare a plan and estimate for paving the footpaths of Wood-lane, between North Pole-road and Shinfield-street.

Hendon.—At a recent meeting of the District Council, the following plans were passed:—Mr. Harry E. Rider, three shops; The Burroughs' Hampstead Tennants, Ltd., stores, offices, and flats, Finchley-road; Mr. A. J. Archer, seven houses, Mill Way, Mill Hill; Hampstead Garden Suburb Trust, Ltd., two groups of staff cottages off Corringham-road, also Children's Home, Erskine-hill; Second Hampstead Tennants, Ltd., group of flats, Addison Way; Mr. Ernest Bates, fourteen houses, Nant-road, Child's Hill; Mr. J. Gibb, three garages, Accommodation-road; Kensington Freehold Land Trust, four shops, Lawrence-street, Mill Hill; Messrs. Haymills, Ltd., forty-eight houses. Among the plans lodged were the following:—Rev. Owen Fitzgerald, Presbytery, Cricklewood-lane, Child's Hill; Mr. P. Dollar, office, warehouse, etc., Cricklewood-lane; Mr. Aish, thirteen houses, Babbington-road and Wroughton-terrace; Hampstead Garden Suburb Company, group of garages, Corringham-road.—At the last meeting of the Council, it was agreed to make up the footway in front of "The George" Hotel, Pinner, also the path near Saltbox-row, Edgware.

Ilford.—The Surveyor has been instructed to carry out the work of putting in a cross-over at the Locksford Bridge tram terminus. The cost is estimated at 130*l*. The following plans have been passed:—Mr. R. G. Capon, surgery, Belmont-road; Mr. E. Ullyett, for the Rev. E. J. Colnett, church hall, Barley-lane; Messrs. Rawlins, Culver, & Co., six houses, Arundel-gardens; Mr. T. G. Geneva, seven houses, Vicarage-lane.

Lambeth.—The Borough Council has accepted the tender of Mr. E. Coules at 200*l*. for the supply, delivery, and erection of a bandstand in Vauxhall Park. This is to be built on a brick base with a cement facing, and with a wood roof covered with zinc of 14 in. gauge. It is also to be of octagonal shape, with eight columns of 4 in. diameter to support roof, with cast-iron railings and gate, and with a ceiling made of wood. The following plans have been passed:—Mr. Frank Salter, twelve houses, Lavengro-road, West Norwood; Mr. R. W. Brading, on behalf of the United Friends Perpetual Benefit Building Society, one-story building, rear of No. 183, Upper Kennington-lane; Messrs. R. Ellis & Son, on behalf of Mr. R. A. Sanders, buildings on site of Nos. 34 and 36, Herne-hill; Mr. T. Martin, building, south side of Wolfington-road; Secretary, London, Chatham, & Dover Railway, one-story lock-up shop, western side of Crystal Palace-parade; Mr. G. T. Jell, on behalf of Messrs. H. B. Barnard & Son, warehouse on site of No. 25, Auckland-street. A plan has been lodged by Mr. T. M. Houghton for the erection of buildings on the west side of Kelloway-street, Acre-lane. Messrs. Adamsez, Ltd., contractors for the carrying out of the work of constructing an underground convenience at the Crystal Palace-parade, have applied to the Council for permission to sublet the constructional part of their contract to Messrs. Grace & Marsh, 49, Tamworth-road, Croydon. This is to be acceded to.

Lewisham.—The roadway leading from Lady-well-road to St. Olave's Union Workhouse is to be formed and paved as a new street at an estimated cost of 200*l*., as is also a part of Perry Rise, at an estimated cost of 1,605*l*. The sewer in Sandrock-road, Lewisham, and a portion of the sewer in Silverdale, Sydenham are to be relaid at estimated costs of 180*l*. and 150*l*. respectively. The following plans have been passed:—Mr. E. H. Wright, branch stores and premises, Rushey Green; Messrs. Norfolk & Prior, five houses, Verdant-lane; Mr. James Watt, fourteen houses, Arran and Culverley roads; Messrs. George Parker

& Son, additions to St. John's Hospital, Morden Hill; Messrs. S. J. Gerrard & Sons, six houses, Shell-road; Messrs. J. W. Heath & Sons, twenty-eight houses, Arthurdon-street and Chudleigh-road; Mr. J. Nicholls, six houses, Manwood-road; Mr. W. D. Monk, store house at Lewisham Infirmary, High-street.

Maldens and Coombe.—At the last meeting of the District Council, the Surveyor submitted plans for widening the highway in Coombe-road, from the railway station to the parish church, at an estimated cost of 680*l.*; also for widening the highway in Kingston-road, from the Kingston boundary to the Prince of Wales public-house, at an approximate cost of 1,920*l.* The plans were approved.

St. Pancras.—Mains are to be extended in three streets at an estimated cost of 65*l.* The roadway on the south side of Tavistock-square is to be relaid with cleaned wood-blocks. Plans have been forwarded by Mr. E. L. Lutyens, on behalf of the Theosophical Society, for the erection of a large building on a site between Tavistock-square and Burton-street. The estimated cost of the building is between 30,000*l.* and 40,000*l.*

Southwark.—The Borough Council have decided to request the London County Council to hand over the 201*l.*, unspent balance of the amount voted by the Council for laying out of the St. George's-yard, for the purpose of tar-paving the footpaths and other works. The following plans have been passed:—Messrs. Briant & Sons, 200, Kennington Park-road, S.E., formation and laying out of a street to lead from Alberta-street to Delverton-road, also for the erection of buildings to abut thereon; Mr. H. Macintosh, Birkbeck Bank-chambers, High Holborn, extensions to South London Central Mission, New Kent-road; Mr. A. Sykes, architect, 45, Finsbury-pavement, E.C., warehouse on site of Nos. 3-8, Bennett-street, and 10-14, Stamford-street. A plan has been lodged by Mr. H. Jackson, 10, South-street, Finsbury-pavement, E.C., for the formation and laying out of a street east side of Queen's-row, also for the erection of thirteen houses.

Staines.—The Rural District Council has passed plans for Mr. T. W. Simpson, for three houses in Common-road, Laleham.

Tottenham.—Application is to be made to the Local Government Board for sanction to a loan of 700*l.*, the amount required for purchasing the land and the carrying out of the necessary works for an improvement at the corner of St. Ann's-road and Seven Sisters-road. The following plans have been passed:—Mr. G. E. T. Lawrence, school and buildings, Culvert-road, South Grove, etc., also school and buildings, Risley-avenue, London County Council Estate; Messrs. Norfolk & Prior, conversion of rink, High-road, into picture palace; Messrs. E. Lawrence & Son, additions to Woodberry Down Chapel, Vartry-road. A plan has been lodged by Mr. C. Duckworth, for a cinematograph theatre at the east corner of Caversham-road and West Green-road.

Tring.—The plan submitted by Mr. Mead has been approved for the erection of additions to the Tring Flour Mills.

Wandsworth.—The Borough Council has accepted the tender of Messrs. E. Parry & Co., at 1,642*l.*, for paving Loxley-road, Springfield, with Victoria indurated stone, also the tender of Messrs. J. Mowlem & Co., Ltd., at 1,690*l.*, for paving Guildersfield-road, Streatham, with Aberdeen adamant. Tenders are to be invited for paving Graecedale-road, Streatham, as a new street, also for repairs to the carriage-way of a part of Crescent-lane, Clapham, South. The following plans have been passed:—Mr. F. L. Poole, additions to the Columbia Phonograph Company's works, Bendon Valley, Springfield; also 131 houses, Granville-road, Wincanton-road, Hambledon-road, Southfield; Messrs. Pilditch, Chadwick, & Co., motor garage, Heathview-gardens; Messrs. Barlow & Roberts, three houses, Christchurch-road, Streatham; Messrs. F. & G. Foster, addition to workhouse, Swaffield-road, Springfield; Mr. C. F. Newman, warehouse, rear of 19, Tooting High-street; Messrs. H. Somerford & Son, alterations and additions to factory and warehouse, Windsor Works, Venn-street, Clapham, North; Messrs. W. Adkins & Son, additions to Mayfield, Bessborough-road, Roehampton; Mr. E. H. Henry, additions to Nos. 30 to 36a, Old Town, Clapham, North; Messrs. Robertson & Barrie, twenty-five houses, Crowborough-road, Streatham; Mr. C. Hallam, Primitive Methodist church and schools, Lynwood-road, Balham; Messrs. J. Marsland & Son, additions to St. Thomas's Roman Catholic Church, West-hill, Southfield; Mr. A. Budd, laundry rear of 99, Tooting High-street.

Watford.—Plans have been passed for Mr. Lewis Evans for additions to Lodge "Russells," also for Mr. Albert Timberlake, for two houses, Nash Mills. The Surveyor, reporting upon this plan, stated that six pairs of houses are proposed to be erected similar to the two already sanctioned.

Wimbledon.—The Council have accepted the tender of Messrs. E. & E. Iles for making up the following streets at the prices mentioned:—The Crescent (sect. 1), 468*l.*; the Crescent (sect. 2), 417*l.*; Crescent-gardens, 220*l.*; Gladstone-road Mews, 120*l.* They have also accepted the tender of Mr. S. Lane for making up Gordondale-road, at 347*l.* Lucien-road is also to be made up at an estimated cost of 365*l.* This work is to be done by direct labour.

OBITUARY.

Mr. J. J. Bannatyne, R.S.W.

The death, in Glasgow, is announced of Mr. J. J. Bannatyne, R.S.W., aged 76 years, member of the Glasgow Art Club, of the Glasgow Institute of the Fine Arts, and, since its formation more than thirty years ago, of the Royal Scottish Society of Painters in Water Colours. Mr. Bannatyne began his career as a designer for Messrs. Dalgleish, Falconer, & Co., calico printers, and frequently contributed to the Royal Academy and other art exhibitions.

Mr. R. H. Crabtree.

The death has occurred at Southport, on 15th inst., of Mr. R. H. Crabtree, representative of the Bath Stone Firms, Ltd., formerly Quarry Manager at Portland, Dorset. Mr. Crabtree was well known and esteemed in the professions, both in the North and South of England.

FOREIGN AND COLONIAL.

German Cement Industry.

To the above subject Sir F. Oppenheimer, the British Consul-General at Frankfort-on-Main, devotes considerable attention in his annual report just received at the Foreign Office. It appears that the market for cement in Germany knows at present only two kinds—Portland cement and slag cement. Most of the cement-producing concerns are share companies, private factories being few and far between. The capital invested reaches a total of 400,000,000 marks. The possible total annual production is estimated at 450,000,000 barrels (of 170 kilos.). For the cement industry generally, the year 1910 is reckoned the worst on record, not excluding the bad years 1903-4. The greatly increased facility of production has led to over-production, because the demand could not increase at an equally rapid pace, and the export, though still increasing, is becoming more and more difficult. The production has increased as follows:—

Year.	No. of Factories.	Production. Barrels.
1877	29	2,200,000
1887	45	7,050,000
1897	65	13,450,000
1901	85	19,5 0,000
1907	88	*27,000,000
1909	112	*45,000,000

*Possible production.

The price, which half-way in the nineties had amounted to about 6 marks 25 pf. per barrel, had, by 1901, sunk to 4 marks. In 1910 the price at times receded to 3 marks 20 pf. to 3 marks 30 pf., in Berlin, even, to 2 marks 50 pf. to 2 marks 80 pf., though the cost of production has not, so far, fallen much below 4 marks, which was the calculated expenditure before the modern methods had come into operation. The home demand was, in 1910, affected by the building strike, and afterwards the building market did not improve as the cement industry had anticipated. The German export to South and Central America has increased during recent years; but these markets will eventually be lost, as the large North American factories push their competitors aside, and as local factories take up the supply, such as are being built in Venezuela, the Argentine Republic, and Chile, partly with the assistance of the respective Governments. In a similar way the markets in China, Java, and Japan are becoming more and more supplied by local factories. The change in the North American market has been remarkable. The consumption has there tremendously increased, so has the local production, which has risen from 150,000 barrels in 1885 to 73,000,000 barrels in 1910. The German export to North America, which in 1895 still amounted to 1,483,453 barrels, receded in 1910 to 83,003 barrels.

The import of foreign cement into Germany has been facilitated by the absence of any German customs duty. The last customs tariff had at first provided a customs duty of 50 pf. per 100 kilos.; but this was abandoned at the subsequent treaty negotiations, and the free entry of foreign cement into Germany secured at least till 1917, the end of the present customs treaties. The demands for a custom tariff, when the opportunity occurs, have never been abandoned by the German cement industry; but they have become louder with the bad result of the year 1910. It should be mentioned that the German cement works have formed a pan-German union, solely with the purpose of controlling the quality. Tests are made with samples taken at regular intervals, without the knowledge of the producing works, and any works failing to reach the standard quality is warned the first time, and the second time is excluded from the union. The German works claim that foreign cement ought to be subjected to the same test upon its entry into Germany.

Works in Austria-Hungary.

The communal council of Mostar, Bosnia, has decided upon the construction of a new water supply aqueduct at a cost of 600,000 kr. (25,000*l.*), and also the erection of a market hall.

The city authorities of Budapest have decided to erect a water tower, with a cubic content of 200,000 cubic metres, at Istenhegy, and to bore two wells and construct a cistern and a syphon conduit in connexion with the Ujlak water works. Tenders will be received by "Dr. Johann Buzáth, IV. Városház-utca 16," Budapest, up to 15 September. Plans may be seen at the office of the Water Works Directorate.

A syndicate, with a capital of 1,600,000 kr. (about 66,700*l.*), has been formed at Pilsen with the Prague advocate Svoisik at its head for the purpose of erecting a large brewery at Tremoschna, near Pilsen.

The Budapest Commission for the construction of municipal dwellings, has decided upon the erection this year, at a cost of 5,000,000 kr. (about 203,000*l.*), of eight five-storied buildings to contain 850 two and three-roomed dwellings. Schools are also to be erected at a cost of 5,000,000 kr.

A hydropathic establishment with 100 rooms is shortly to be constructed at Budapest. According to the plans prepared by Eduard Dvorak, the cost will be 1,600,000 kr. (about 66,700*l.*).

A company, under the name of the Helenenhof Imperial Hotel Company, has been formed at Carlsbad by Lord Westbury, of London, Alfred Schwalb, of Carlsbad, Messrs. Wayss & Freytag, Meinong, and Portois & Fix, of Vienna, for constructing and managing an hotel at Carlsbad, and for obtaining concessions for the construction of light railways. The company has a capital of 4,000,000 kr. (about 167,000*l.*), which can be raised to 11,000,000 kr. (about 458,000*l.*).

PATENTS.

APPLICATIONS PUBLISHED.*

20,240 of 1910.—Arthur Ramén: Tunnel kilns or furnaces.

20,247 of 1910.—Arthur Ramén: Method of working tunnel kilns or furnaces for burning bricks of ore, clay, and the like.

20,303 of 1910.—Edward Williams: Window and like stays.

24,934 of 1910.—Harold Merrylees and Merrylees & Co., Ltd.: Construction of fireplaces or the like from plastic fireproof compositions.

25,901 of 1910.—George Loudon: Hoisting machinery.

26,029 of 1910.—George William Hulbert and Charles Henry Hulbert: Machine for cutting arch bricks, terra-cotta blocks, and the like.

2,332 of 1911.—Edward Charles Robert Marks (McElroy, Shepherd, & Co.): Apparatus for mixing and applying concrete and the like by spraying.

5,183 of 1911.—Santiago Dominguez: Blocks, tiles, and the like, for pavements and similar purposes.

8,581 of 1911.—Reinhold Stoye: Scaffolding frames.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the prepaid rate of 18s. per annum, with delivery by Friday Morning's Post in London and its suburbs.

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Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," 4, Catherine-street, W.C.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointment, xix; Auction Sales, xxiv.

Certain conditions beyond those given in the following information are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

⁂ It must be understood that the following paragraphs are printed as news, and not as advertisement; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Competitions.

SEPTEMBER 12-25.—**Athens.**—COURT OF JUSTICE.—An international competition is instituted by the Ministry of the Interior, for the erection of Court buildings, to cost 160,000*l.* The *Official Gazette* may be seen at the Library of the R.I.B.A.

OCTOBER 4. — **Easington R.D.C.** — 100 model houses for Murton Colliery, Durham. 2½ per cent. on net cost to successful architect.

OCTOBER 7. — **Barnsley.** — EXTENSION OF BATHS.—The Barnsley T.C. invite drawings for proposed extension of Public Baths. Three premiums are offered—50*l.*, 30*l.*, 20*l.* See advertisement in issue of August 11 for further particulars.

OCTOBER 7. — **Evesham U.D.C.** — Designs for laying out site and erecting thereon thirty cottages. Particulars from the Clerk to the Council.

OCTOBER 12.—**Cosseley.**—Plans are invited for a school to accommodate about 200 children. Particulars from the Education Offices, Cosseley, near Bilston.

OCTOBER 14. — **Bristol.** — ALTERATIONS IN THE GRAND HOTEL. — Particulars from Mr. F. A. Jenkins, 44, Corn-street, Bristol.

OCTOBER 28. — **Salford.** — Extension of office accommodation on workhouse site at Eccles New Road. Premiums 20*l.* and 10*l.* Particulars from the Board of Guardians, Salford. Limited to architects practising in Salford and district only.

OCTOBER 30.—**Holland.**—STAINED GLASS WINDOW.—Designs are invited for a stained glass window to be erected in the University at Groningen. See advertisement in issue of June 9 for further particulars.

OCTOBER 31. — **Marylebone.** — NEW MUNICIPAL BUILDINGS.—Premiums of 100*l.*, 75*l.*, 50*l.* The assessor is Mr. Henry T. Hare, F.R.I.B.A. See advertisement in issue of July 14 for further particulars.

NOVEMBER 1. — **City of St. Petersburg.**—MONUMENT TO ALEXANDER II.—Particulars in our issue of August 13, 1910.

NOVEMBER 30.—**Cardiff.**—TECHNICAL INSTITUTE.—The Cardiff Education Committee invite designs and estimates for a technical institute. See advertisement in issue of August 18 for further particulars. Successful architect to carry out work. Premiums of 125*l.*, 75*l.*, and 50*l.* to other competitors. Mr. J. S. Gibson, assessor.

NOVEMBER 30. — **Hastings.** — EAST SUSSEX HOSPITAL.—The Joint Committee of the East Sussex Hospital and King Edward VII. Memorial Funds invite designs for new hospital. See advertisement in issue of August 25 for further particulars. Premiums of 125*l.*, 75*l.*, and 50*l.* Mr E. T. Hall, assessor.

DECEMBER 29. — **Glasgow.** — DESIGN FOR A BRIDGE.—Designs are invited (Alexander Thomson Travelling Studentship) for a bridge. Premiums of 60*l.* and 20*l.* are offered. See advertisement in issue of December 24 for further particulars.

JANUARY 29, 1912.—**Montevideo.**—Government palace (premiums, 2,125*l.* and 850*l.*) and town improvement scheme (premiums, 1,060*l.*, 640*l.*, and 425*l.*). Conditions may be seen at the Board of Trade, 73, Basinghall-street, E.C.

JANUARY 31, 1912. — **Australia.** — DESIGNS FOR FEDERAL CAPITAL CITY.—The Government of the Commonwealth of Australia invite competitive designs for the laying out of this Federal capital city. See advertisement in issue of September 1 for further particulars.

JULY 1, 1912.—**Dusseldorf.**—A plan for the extension of the City of Dusseldorf. Premiums of 1,000*l.* to 375*l.* Conditions on application to the Chief Burgomaster, Dusseldorf.

NO DATE. — **Nottingham.** — BAPTIST CHURCH AND PREMISES.—Limited to Nottingham architects. Particulars from Messrs. Rorke & Jackson, solicitors, King-street, Nottingham

NO DATE.—**Rochdale Infirmary.**—EXTENSIONS.—Assessor, Mr. Alex. Graham, F.R.I.B.A.

Contracts.

BUILDING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

SEPTEMBER 23.—**Morpeth.**—ADDITIONS.—Alterations and additions to premises. Drawings and specifications with the architect, Mr. C. Franklin Murphy, Newgate-street, Morpeth. Deposit of 1*l.* 1s.

SEPTEMBER 23. — **Newcastle-under-Lyme.** — SEWERS, ETC.—Alterations to w.c.'s and sewers at the workhouse. Messrs. Chapman & Snape, architects, Newcastle.

SEPTEMBER 23.—**Pyle.**—COTTAGES.—Erection of four cottages at North Cornelly. Plans and specifications from Mr. Aneurin T. James, architect and surveyor, Risley House, Pyle, near Bridgend.

SEPTEMBER 25.—**Belfast.**—WAREHOUSE.—Erection and completion of a warehouse. Drawings and specifications with Messrs. Blackwood & Jury, MM.R.I.A.I., architects, 41, Donegall-place, Belfast, and quantities, on deposit of 2*l.* 2s., from Messrs. M'Carthy and Brookes, surveyors, Scottish Provident Buildings, Belfast.

SEPTEMBER 25.—**Poole.**—WORKS.—For various works at buildings for the Borough Council. Particulars and forms of tender from Mr. Samuel J. Newman, F.R.I.B.A., Borough Surveyor, Municipal Offices, Market-street, Poole.

SEPTEMBER 25.—**Ripponden.**—SHOP-FRONT, ETC.—Alteration to shop front. Apply to Manager, Ripponden Co-operative Society, Ltd., Oldham-road, Ripponden, Yorks.

SEPTEMBER 25.—**Seabrook.**—ALTERATIONS.—For slight alterations to the Court House at the police station. Plan and specification from Mr. Frederick W. Ruck, County Architect, 86, Week-street, Maidstone.

SEPTEMBER 25.—**Swansea.**—ADDITIONS, ETC.—Alterations and additions to the boys' school at Clydach. Plans and specification seen at Clydach Police Station, and with Mr. T. Mansel Franklen, Clerk to the County Council, Glamorgan County Council Offices, Westgate-street, Cardiff.

SEPTEMBER 25.—**Wareham.**—WALLS.—Erection of boundary walls, etc. Plans and specification seen, and quantities from Mr. W. W. Fookes, surveyor, Wareham.

SEPTEMBER 26.—**Aylesbury.**—DECORATION, ETC.—For decorating, sanitary, and other work to "The Grove," Grendon Underwood. Specification and plans with Mr. Fred Taylor, A.R.I.B.A., 7, Bourbon-street, Aylesbury.

SEPTEMBER 26.—**Newport, Mon.**—LATRINES, ETC.—Construction of latrines and play-shed at schools. Specification and quantities from the Borough Architect, Mr. C. F. Ward, A.R.I.B.A., Town Hall, Newport. Deposit of 1*l.* 1s.

SEPTEMBER 26.—**Norwich.**—BUILDINGS.—Erection of new office buildings in Duke-street. Quantities and form of tender from Mr. F. M. Long, A.M.Inst.C.E., City Electrical Engineer, Corporation Electricity Works, Duke-street, Norwich. Deposit of 2*l.* 2s.

SEPTEMBER 26. — **Risca.**—ADDITIONS.—Alterations and additions to houses. Plans and specification with Messrs. T. E. Richards & Kaye, architects, Market-square-chambers, Pontypridd.

SEPTEMBER 26.—**Tirphil, Wales.**—HALL.—Erection of lecture-hall at the Tirphil Liberal Club. Plans and specification at the club. Mr. T. Beaver, Secretary.

SEPTEMBER 27.—**Ash-next-Sandwich.**—HALL.—Erection of new parish hall. Plans and specification, with quantities, on deposit of 2*l.* 2s., from Messrs. Jennings & Gray, architects, 4, St. Margaret's-street, Canterbury.

SEPTEMBER 27.—**Farnham.**—ADDITIONS.—Alterations and additions to maternity ward, Farnham Infirmary. Plans and specifications with the architects, Messrs. Friend & Lloyd, Aldershot.

SEPTEMBER 27.—**Goole.**—CHIMNEY.—For raising the Pollington Waterworks chimney 30 ft. Specification and full particulars from the Gas and Water Engineer.

SEPTEMBER 27.—**Gosport.**—MENAGE.—Construction of a menage at Gosport. Plan and specification seen, and quantities from the architects, Messrs. Rake & Cogswell, Prudential-buildings, Portsmouth.

SEPTEMBER 27. — **London.** — DINING HALL. — Extension of the dining hall at workhouse, at No. 5, Woodfield-road, Harrow-road. Quantities and form of tender from the architect, Mr. E. Howley Sim, Mowbray House, 14, Norfolk-street, Strand, W.C. on deposit of 3*l.*

SEPTEMBER 28.—**Kendal.**—ALTERATIONS, ETC.—For making out further sick wards, alterations, and renewals and repairs at the workhouse. Plans and specifications seen and quantities from Mr. Stephen Shaw, F.R.I.B.A., architect, Kendal.

SEPTEMBER 29.—**Broughton.**—ROOM.—Erection of a corrugated-iron cookery-room at the council school. Plan and specification from Mr. W. J. Taylor, County Surveyor, The Castle, Winchester. Deposit of 2*l.* 2s.

SEPTEMBER 29.—**Liscard.**—OFFICE.—Erection of a new sorting office. Drawings, specification, conditions, and form of contract with the Postmaster, Birkenhead. Quantities and forms of tender, on deposit of 1*l.* 1s., from the Secretary, H.M. Office of Works, etc., Storey's-gate, London, S.W.

SEPTEMBER 30.—**Mwll.**—PAVILIONS, ETC.—Erection of shelters and pavilions at Pickering Park. Particulars from Mr. A. E. White, M.Inst.C.E., City Engineer, Town Hall, Hull.

SEPTEMBER 30.—**Pant-y-waun.**—COTTAGES, ETC.—Alterations to existing cottages and erection of three new cottages. Plans and specification with Mr. T. Edmund Rees, architect, Merthyr Tydfil.

SEPTEMBER 30.—**Preston.**—ADDITIONS.—Alterations and additions to buildings in Syke-street. Quantities from Mr. J. P. Fraser, architect, 14, Elliot-street, Liverpool.

SEPTEMBER 30.—**Troedyrhiw.**—ALTERATIONS.—For alterations to No. 6, Castle Houses. Plans and specification with Mr. T. Edmund Rees, architect, Merthyr Tydfil.

OCTOBER 2.—**Londonderry.**—HOUSE, ETC.—For erection of a professor's house and gate lodge and alterations to the college. Plans and specifications with Messrs. Robinson & Davidson, C.E., A.R.I.B.A., Richmond-street, Londonderry.

OCTOBER 2.—**Poole.**—STEPS.—Erecting wooden steps at Sandbanks. Plans, specifications, etc., from Mr. H. Kendall, M.S.A., architect and surveyor, Poole, Hants.

OCTOBER 3.—**Newry.**—STORE.—The Great Northern Railway Company (Ireland) invite tenders for the building of a goods store at their Edward-street Station, Newry. Drawing and specification at the Chief Engineer's Office, Amiens-street Terminus, Dublin, and District Engineer's Office, Belfast. Quantities and forms of tender on deposit of 2*l.* 2s. from Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin.

OCTOBER 4.—**Edinburgh.**—FLOORS, ETC.—Erection of the reinforced concrete floors, roofs, beams, columns, staircases, etc., in connexion with the Royal Scottish Museum new administration offices. Conditions of contract at H.M. Office of Works, 3, Parliament-square, Edinburgh, or at H.M. Office of Works, G.P.O., Glasgow. Drawings, with specification and form of tender, from H.M. Office of Works, 3, Parliament-square, Edinburgh, on deposit of 1*l.* Tenders to the Secretary, H.M. Office of Works, Storey's-gate, London, S.W.

OCTOBER 4.—**Eltham.**—CONVENIENCE, ETC.—Erection of a waiting-room and sanitary convenience at the tramway terminus. Drawing, specification, and form of tender, on deposit of 1*l.* 1s., from Mr. J. Rush Dixon, M.Inst.C.E., Borough Engineer, Town Hall, Woolwich.

OCTOBER 5.—**Edlington.**—SCHOOL.—Erection of a school. Plans seen and specifications, with quantities, on deposit of 1*l.*, from the Education Architect, County Hall, Wakefield.

★ OCTOBER 5.—**London.**—EXTENSION OF LAND REGISTRY.—The Commissioners of H.M. Works and Public Buildings invite tenders for extension of the Land Registry. See advertisement in this issue for further particulars.

★ OCTOBER 6. — **Totton.** — DRILL-HALL. — The Southampton Territorial Forces Association invite tenders for drill-hall, Totton, Hants. See advertisement in this issue for further particulars.

OCTOBER 7.—**Bredbury.**—CENTRE.—Erection of a special subjects centre at Berrycroft-lane. Plans and specifications and quantities from the architects, Messrs. Sankey & Cubbon, F.R.I.B.A., 4, Chapel-walks, Manchester, on deposit of 1*l.* 1s.

OCTOBER 7.—**Halifax.**—SHELTERS.—Erection of tramway shelters. Particulars from Borough Engineer, Town Hall, Halifax.

OCTOBER 7.—**Ledsham.**—FARM BUILDINGS.—Erection and extension of farm buildings on the Ledsham Estate. Plans seen, and specifications and quantities, on deposit of 1*l.*, from the C.C. Land Agent, County Estate Office, 49, Northgate-street, Chester.

OCTOBER 9.—**Dowlais.**—COTTAGES.—Erection of five concrete cottages at Gellifaelog. Plan and specification from the Deputy Surveyor, Town Hall, Merthyr Tydfil. Deposit of 1*l.* 1s.

OCTOBER 10.—**Crumlin, Mon.**—HALL, ETC.—The Great Western Railway invite tenders for the construction of a new booking hall, footbridge, etc., at Crumlin station. Plans and specifications seen, and quantities from the Engineer at Newport station.

OCTOBER 10.—**Handsworth, etc.**—STABLES.—The Great Western Railway invite tenders for the erection of stables at Handsworth, Wednesbury, and Langley Green. Plans and specification seen, and quantities from the Engineer at Wolverhampton station.

OCTOBER 11.—**Caister-on-Sea.**—SCHOOL.—Erection of new school. Plans seen and quantities on deposit of 1*l.* 1s. from Messrs. Olley & Haward, architects, 5, Queen-street, Great Yarmouth.

OCTOBER 16.—**Stockport.**—LIBRARY.—Erection of a new central library. Specifications and quantities from the architects, Messrs. Bradshaw & Gass, 19, Silverwell-street, Bolton; or Messrs. Hewitt & Son, quantity surveyors, 33, Brazennose-street, Manchester. Deposit of 2*l.* 2s.

BUILDING—continued.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

* OCTOBER 17.—**Macclesfield.**—ALTERATIONS AND ADDITIONS.—The Macclesfield Education Committee invite tenders for alterations and additions to Technical School premises. See advertisement in this issue for further particulars.

OCTOBER 19.—**Denton.**—SCHOOL.—Erection of a new elementary school. Plans seen and quantities from the County Architect, Mr. Henry Littler, 16, Ribblesdale-place, Preston. Deposit of 2l.

OCTOBER 19.—**Failsworth.**—SCHOOL.—Erection of a new elementary school. Plans seen and quantities from the County Architect, Mr Henry Littler, 16, Ribblesdale-place, Preston. Deposit of 2l.

* NOVEMBER 2.—**St. Albans.**—RESIDENCES.—The Middlesex County Council invite tenders for six pairs of semi-detached residences for asylum attendants at Napsbury, St. Albans. See advertisement in this issue for further particulars.

No DATE.—**Golcar.**—HOUSE.—Erection of a dwelling-house. Plans seen and quantities from Mr. A. Shaw, architect, Golcar.

No DATE.—**Grange-over-Sands.**—RESIDENCE.—Erection of a doctor's residence at the Meathop Sanatorium. Plans and quantities from Mr. John Hutton, M.R.S.I., architect, Kendal.

No DATE.—**Hillsborough.**—SHOPS, ETC.—Erection of shops and office buildings in Holme-lane. Quantities from the architect on deposit of 2l. 2s. Mr. J. W. Winter, architect, St. Peter's Close, Sheffield.

No DATE.—**Keighley.**—MOTOR WORKS.—Erection of a motor works. Messrs. J. B. Bailey & Son, architects, 3, Scott-street, Keighley.

No DATE.—**Lepton.**—HOUSES.—Erection of eight dwelling-houses in Wakefield-road, Tandem. Plans, specification, and quantities from Messrs. Brook, Dransfield, & Dyson, architects and surveyors, Estate-buildings, Huddersfield.

No DATE.—**Maryborough.**—SCHOOLS.—Erection of schools. Plans and specification seen, and quantities from Mr. James Mackey, 58, Dame-street, Dublin, on deposit of 1l. 1s. Mr. Francis Bergin, Borough Engineer, 36, Westmoreland-street, Dublin.

No DATE.—**Ogmore Vale.**—OFFICES.—Erection of offices at Ogmore Vale for Messrs. the Lewis-Merthyr Consolidated Colliery Company, Ltd. Quantities, on deposit of 2l. 2s., from Mr. James T. Jenkins, M.S.A., architect and surveyor, Porth, Glam.

No DATE.—**Wakefield.**—INSTITUTE, ETC.—Erection of a men's institute and extension of Clarendon-street schools. Messrs. Massie & Holdsworth, architects and surveyors, Tetley House, Wakefield.

No DATE.—**Wayland.**—INFIRMARY.—Erection of new infirmary buildings. Quantities from the architect, Mr. Herbert J. Green, of 31, Castle Meadow, Norwich. Deposit of 5l. 5s.

No DATE.—**West Wylam-on-Tyne.**—HALL, ETC. Erection of miners' hall, etc. Messrs. W. Dixon & Son, architects, Bigg Market, Newcastle.

ENGINEERING, IRON, AND STEEL.

SEPTEMBER 26.—**Belfast.**—ELECTRIC INSTALLATION.—Installation of conductors and equipment at the new abattoir. Plans and conditions seen, and specification from the City Surveyor. Deposit of 1l. 1s.

SEPTEMBER 27.—**Ashford.**—BRIDGE.—Alterations and additions to the Wye Bridge. Quantities and tender form from Mr. F. W. Ruck, County Architect, 26, Week-street, Maidstone.

SEPTEMBER 26.—**Diss.**—WATERWORKS.—For construction of waterworks. Specifications from the engineer, Mr. W. H. Booth, 38, Broad-street-avenue, London, E.C. Deposit of 3l.

SEPTEMBER 30.—**Hebburn.**—BRIDGE.—Construction of a light steel bridge across the Wallsend and Hebburn Coal Company's railway. Surveyor, Mr. H. Paterson, Council Offices, Hebburn.

SEPTEMBER 30.—**Langholm.**—WATERWORKS.—Construction of waterworks, reservoir, etc. Plans seen, and specification and quantities, on deposit of 3l. 3s., from the engineers, Messrs. Taylor & Wallin, Cathedral-buildings, Newcastle-on-Tyne.

SEPTEMBER 30.—**Liverpool.**—LIFTS, ETC.—Electric lifts, electric lighting, and sanitary fittings at the workhouse, Brownlow-hill. Mr. G. W. Coster, Vestry Clerk, Parish Offices, Brownlow-hill, Liverpool.

OCTOBER 16.—**Hastings.**—LIGHTING.—For electric light installation at the workhouse. Specification and form of tender from Mr. S. Bumstead, Acting Clerk, 11, Wellington-square, Hastings.

DECEMBER 30.—**Newport, Mon.**—BRIDGE.—Construction of a ferro-concrete bridge across the river Usk. Particulars from Mr. H. Tremelling, A.M.Inst.C.E., Borough Engineer, Town Hall, Newport.

FURNITURE, PAINTING, MATERIALS, etc.

SEPTEMBER 23.—**Whitby.**—PAINTING.—For cleaning and painting the iron bridge, near Glaisdale station. Mr. J. Lyth, Surveyor, Union Offices, Church-street, Whitby.

SEPTEMBER 25.—**Huddersfield.**—PAINTING.—For various painting works for the Corporation. Specifications seen and quantities from Mr K. F. Campbell, M.Inst.C.E., Borough Engineer and Surveyor, 1, Peel-street.

SEPTEMBER 26.—**Oldham.**—PAINTING.—For painting and decorating at the Gas and Water Offices. Specifications from Mr. A. Andrew, general manager.

OCTOBER 3.—**Exmouth.**—PAINTING.—For painting kitchen, pantry, and scullery at the Exmouth Cottage Hospital. Mr. L. Tracey, Hon. Sec.

ROADS, SANITARY AND WATER WORKS.

SEPTEMBER 23.—**Bedwellty.**—GRANITE, ETC.—Supply of broken limestone and granite. Forms of tender from the Council's Surveyor, Mr. J. H. Lewis, A.M.Inst.C.E., Blackwood, Mon.

SEPTEMBER 23.—**New Tredegar.**—SEWER.—Construction of a 9-in. sewer. Plans from the Surveyor, Mr. J. H. Lewis, A.M.Inst.C.E., Blackwood, Mon.

SEPTEMBER 25.—**Alfreton.**—GRANITE, ETC.—For supply of granite edge kerb and concrete flags. Specification from Mr. R. F. Ward, Surveyor to the Council, King-street, Alfreton.

SEPTEMBER 25.—**Ilford.**—CEMENT.—Supply of cement. Particulars from Mr. H. Shaw, M.Inst.C.E., Surveyor to the Council, Town Hall, Ilford.

SEPTEMBER 25.—**Warrington.**—CUBES.—Supply of granite cubes. Specifications from Mr. T. Longdin, Borough Engineer and Surveyor, Town Hall, Warrington.

SEPTEMBER 26.—**Derby.**—ROADS.—For various street works. Plans and specification seen, and quantities from Mr. John Ward, M.Inst.C.E., Borough Surveyor, Borough Surveyor's Office, Babington-lane, Derby.

SEPTEMBER 26.—**Hanwell.**—MATERIALS.—Supply of materials, etc. Mr. P. Scott, Clerk, Council Offices, Hanwell, W.

* SEPTEMBER 26.—**Kilburn.**—WOOD PAVING.—The Willesden D.C. invite tenders for wood paving in Dyne-road. See advertisement in this issue for further particulars.

SEPTEMBER 26.—**Sowerby Bridge.**—STREETS.—For various street works. Quantities from Mr. G. E. Wrigley, Engineer's Office, Sowerby Bridge, Yorks.

SEPTEMBER 27.—**Cardiff.**—STREETS.—For making up streets. Drawings and specifications seen and forms of tender from the City Engineer, City Hall, Cardiff.

SEPTEMBER 27.—**Padiham.**—PIPES.—Supply and delivery of cast-iron pipes. Specification and form of tender from Mr. J. Gregson, Engineer and Surveyor, Town Hall, Padiham.

SEPTEMBER 29.—**Bexhill.**—PAVING.—For paving footpaths. Specification and form of tender from Borough Surveyor, Town Hall, Bexhill.

OCTOBER 2.—**Bolton-upon-Dearne.**—STREETS.—For private street works. Specifications seen and quantities on deposit of 1l. 1s., from the Surveyor, Council Buildings, Bolton-upon-Dearne.

OCTOBER 2.—**Bromsgrove.**—SEWERAGE.—Construction of sewers at Barnt Green and enlargement of sewage disposal works at Alvechurch. Drawings, specification, and quantities from the engineer, Mr. William Fiddian, F.S.I., Old Bank Offices, Stourbridge. Deposit of 3l. 3s.

OCTOBER 2.—**Enniskillen.**—METAL.—For supply of road metal. Mr. A. W. G. Ritchie, Town Clerk, Town Hall, Enniskillen.

OCTOBER 3.—**Dundalk.**—DRAINAGE.—The Great Northern Railway Company (Ireland) invite tenders for carrying out of drainage scheme in the Dundalk station premises and buildings. Drawings and specification at the Chief Engineer's Office, Amiens-street Terminus, Dublin, and District Engineer's Office, Belfast. Quantities and forms of tender on deposit of 2l. 2s. from Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin.

* OCTOBER 3.—**Ealing.**—ROAD-MAKING.—The Ealing Town Council invite tenders for making up of various roads. See advertisement in this issue for further particulars.

OCTOBER 3.—**Watford.**—ROADS.—For making-up roads. Plans and specifications seen at the Council Offices, and quantities from Mr. D. Waterhouse, Engineer and Surveyor to the Council, on deposit of 1l. Council Offices, 16, High-street, Watford.

* OCTOBER 4.—**London, S.W.**—ROADS, ETC.—The Commissioners of H.M. Works and Public Buildings invite tenders for completion of roads, etc., round generating station at Imperial Institute, South Kensington. See advertisement in this issue for further particulars.

OCTOBER 4.—**Maldon.**—PAVING.—For paving and kerbing footway. Plan and specification seen, and form of tender from Mr. T. R. Swales, Borough Surevyor, Maldon, Essex.

OCTOBER 9.—**Batley.**—PAVING, ETC.—For the levelling, paving, channelling, and completing of Bank Foot-place. Plans and specifications with the Borough Engineer and Surveyor (Mr. Oscar J. Kirby), Town Hall, Batley.

OCTOBER 9.—**Bury.**—SEWER.—Construction of brick sewer. Drawings seen, and specification and quantities from the Borough Engineer, on deposit of 2l.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*CLERK OF WORKS	Rochford Union	3l. 3s. per week	Sept. 25

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*DEALS, BATTENS, BOARDS, TIMBER, ETC.—Great Hall, Winchester House, E.C.	Churchill & Sim	Sept. 27
*PLANT AND MACHINERY, COUNTY HALL SITE, S.E.—On the Premises	H. J. Bromley	Sept. 28
*BLDG. & AGRI. LAND, SITE OF SANITM., RESI., ETC., BEXHILL-ON-SEA—At the Mart	Debenham, Tewson, Richardson, & Co.	Oct. 10
*FREEHOLD BUILDING SITE, GT. ST. HELEN'S, E.C.—At the Mart	Edwin Fox, Bousfield, Burnetts, & Baddeley	Oct. 18
*FREEHOLD BLDG. EST., STABLING, & COTTGS., TOOTING & HACKBDG.—At the Mart	Debenham, Tewson, Richardson, & Co.	Oct. 24
*FREEHOLD BUILDING LAND, FULHAM—Estate Room, 20, Hanover-square, W.	Knight, Frank, & Rutley	Nov. 8

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 2.—By SEXTON & GRIMWADE.
Peldon, Essex.—Games farm, 20 a. 2 r. 23 p., f. £310

September 4.—By SEXTON & GRIMWADE.
Groton, Suffolk.—Groton Hall Estate, 14 acres, f. 3,050

September 5.—By E. S. BEARD & DANIELL.
Colchester, Essex.—Butt-rd., Lord Cardigan Inn and shop adjoining, f. 425
15, 16, 17, 86, 87, and 88, Albert-st., and 23, Albert-rd., f. 900

September 6.—By KIVELL & HARRIS.
St. Gennys, Cornwall.—Crackington Manor Estate, 2,109 acres, f. 17,366

By J. HANNAFORD & SON.
Winkleigh, Devon.—Riddlestone and West Luxton Farm, 170 a. 2 r. 21 p., f. £3,010

September 7.—By J. HANNAFORD & SON.
Morchard Bishop, Devon.—Cottage and 1 acre, f. 210

By E. J. GILDERS & Co.
Frating, Essex.—Hill Farm, 43 a. 2 r. 3 p., f. 950

By ELLIOTT & SONS.
Preston, Sussex.—28 and 34, Preston rd., f., y.r. 70l. 1,035
23, Stanford-av., f., y.r. 65l. 810
16, Campbell-rd., f., w.r. 32l. 10s. 325
154, Havelock-rd., f., o.r. 28l. 340
Brighton, Sussex.—10, Pelham-st., f., w.r. 27l. 6s. 240

By BARBER & SON.
Rodington, Salop.—Rodington Estate (part of), 915 acres, f. 28,803

September 11.—By HAMPTON & SONS.
Ashford Carbonell, Salop.—Accommodation land, cottages, and 38 a. 0 r. 39 p., f. £3,30[illegible]

September 12.—By MADDISON, MILES, & MADDISON.
Yarmouth.—31, Nelson-rd. North, f. 61[illegible]

By DREWEATT & WATSON.
Thatcham, Berks.—Five cottages, f. 37[illegible]

September 12.—By SCOTT PITCHER.
Chailey, Sussex.—Mascalls Farm, 4 a. 3r. 20 p., f. and c. 50[illegible]

September 14.—By GRIMLEY & SON.
Bournville, Worcs.—186, 188, and 190, Beaumont-road, u.t. 82 yrs., g.r. 12l., w.r. 58l. 1s. 37[illegible]
Erdington, Warwick.—42, Holliday-rd., u.t. 112 yrs., g.r. 4l., w.r. 18l. 12s. 24[illegible]

King's Norton, Warwick.—55 to 77 (odd), —Frances-rd., u.—86 yrs., g.r. 30/., w.r. 167. 12s.		£790
Stirchley, Worcs.—11, 13, and 15, Charlotte-rd., u.t. 86 yrs., g.r. 13/., w.r. 43/. 18s.		140
Wandsworth, S.W.—81, 83, and 85, Douglas-rd., u.t. 75 yrs., g.r. 12/., w.r. 53/. 6s.		190
Ladywood, Birmingham.—207 to 213 (odd), St. Vincent-st., u.t. 40 yrs., g.r. 27/., w.r. 144. 1[illegible]		750
Small Heath, Birmingham.—111, Golden Hillock-rd., u.t. 53 yrs., g.r. 4/. 15s. 6d., y.r. 22/.		230

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; r.g.r. for redeemable ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for pension; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; ln. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; gr. for grove; gdns. for gardens; yd. for yard; gr. for grove; h.h. for beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to "THE PUBLISHER," and not to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for competition should bear the owner's name and address either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River.	£ s. d.
Best Stocks	1 13 0
Picked Stocks for Facings	2 7 0

Per 1000, Delivered at Railway Depôt.

	£ s. d.
Fletton	1 9 0
Best Fareham Red	3 12 0
Best Red Pressed Ruabon Facing	5 0 0
Best Blue Pressed Staffordshire	3 15 0
Do. Bullnose	4 0 0
Best Stourbridge Fire Bricks	3 14 0

GLAZED BRICKS.

	£ s. d.
Best White and Ivory Glazed Stretchers	10 17 6
Headers	10 7 6
Quoins, Bullnose, and Flats	14 7 6
D'ble Stretchers	16 7 6

	£ s. d.
Double Headers	13 7 6
One Side and two Ends	17 7 6
Two Sides and one End	19 7 6
Splays & Squints	15 17 6
Best Dipped Salt Glzd. Str'tch'rs	10 17 6
Headers	10 7 6
Quoins, Bullnose, and Flats	14 7 6
D'ble Stretchers	16 7 6
Double Headers	13 7 6
One Side and two Ends	17 7 6
Two Sides and one End	19 7 6
Splays & Squints	15 17 6

Second Quality White and Dipped Salt Glazed, £1 5s. per 1000 less than best.

	s. d.	
Thames and Pit Sand	6 9	per yard, delivered.
Thames Ballast	5 3	" "
Best Portland Cement	29 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s. 6d. per yard delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly dpt.

STONE.

Per Ft. Cube.

	s. d.
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½

PORTLAND STONE (20 ft. average)—

Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1
White Basebed, delivered on road waggons Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 3½

Per Ft. Cube, delivered at Railway Depôt.

	s. d.		s. d.
Ancaster in blocks	1 10	Closeburn Red Freestone	2 0
Beer in blocks	1 6	Red Mansfield Freestone	3 4
Greenshill in blocks	1 10	Talacre & Gwespyr Stone	2 8
Darley Dale in blocks	2 4		
Red Corsehill in blocks	2 3		

STONE (Continued).

YORK STONE—*Robin Hood Quality.*

Per Ft. Cube, Delivered at Railway Depôt. s. d.

Scappled random blocks	2 10

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3
6 in. rubbed two sides ditto, ditto	2 6
3 in. sawn two sides slabs (random sizes)	0 11½
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7
1¼ in. to 2 in. ditto, ditto	0 6

HARD YORK—

Per Ft. Cube, Delivered at Railway Depôt.

Scappled random blocks	3 0

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landing to sizes (under 40 ft. super.)	2 8
6 in. rubbed two sides ditto	3 0
3 in. sawn two sides slabs (random sizes)	1 2
2 in. self-faced random flags	0 8

SLATES.

Per 1000 of 1200 at Railway Depôt.

In. In.	£ s. d.	In. In.	£ s. d.
20×10 best blue Bangor	13 2 6	20×10 best Eur'ka unfading green	15 17 6
20×12 ditto	13 17 6	20×12 ditto	18 7 6
20×10 1st quality ditto	13 0 0	18×10 ditto	13 5 0
20×12 ditto	13 15 0	16×8 ditto	10 5 0
16×8 ditto	7 5 0	20×10 permanent green	11 12 6
22×10 best blue Portmadoc	12 12 6	18×10 ditto	9 12 6
16×6 ditto	6 12 6	16×8 ditto	6 12 6

TILES.

At Railway Depôt.

	s. d.		s. d.
Best plain red roofing (per 1000)	42 0	Best "Hartahill" brand, plain sand-faced (per 1000)	50 0
Hip and Valley (per doz.)	3 7	Do. pressed (per 1000)	47 6
Best Broseley (per 1000)	50 0	Do. Ornamental (per 1000)	50 0
Do. Ornamental (per 1000)	52 6	Hip (per doz.)	4 0
Hip and Valley (per doz.)	4 0	Valley (per doz.)	3 6
Best Ruabon red, brown, or brindled (Edw'ds) (per 1000)	57 6	Staffords. (Hanley) Reds or Brindled (per 1000)	42 6
Do. Ornamental (per 1000)	60 0	Hand-made sand-faced (per 1000)	45 0
Hip (per doz.)	4 0	Hip (per doz.)	4 0
Valley (per doz.)	3 0	Valley (per doz.)	3 6

WOOD.

BUILDING WOOD.	At per standard. £ s. d.		£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 0 0	...	15 10 0
Deals: best 3 by 9	13 10 0	...	14 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	...	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	...	less than 7 in. and 8 in. less than best.
Deals: seconds	1 0 0		
Battens: seconds	0 10 0		" "
2 in. by in. and 3 in. by 6 in.	9 10 0	...	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	...	10 0 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0		more than battens.
¾ in.	1 0 0		"

	At per load of 50 ft.		
Fir timber: best middling Danzig or Memel (average specification)	5 0 0	...	5 10 0
Seconds	4 10 0	...	5 0 0
Small timber (8 in. to 10 in.)	3 17 6	...	4 0 0
Small timber (6 in. to 8 in.)	3 5 0	...	3 10 0
Swedish balks	2 12 6	...	3 0 0
Pitch-pine timber (50 ft. average)	4 10 0	...	5 5 0

JOINERS' WOOD.	At per standard.		
White Sea: first yellow deals, 3 in. by 11 in.	24 10 0	...	25 10 0
3 in. by 9 in.	22 10 0	...	23 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	...	18 0 0
Second yellow deals, 3in. by 11in.	19 0 0	...	20 0 0
" " 3 in. by 9 in.	18 0 0	...	19 10 0
Battens, 2½ in. and 3in. by 7 in.	14 0 0	...	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	...	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	...	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 10 0	...	22 10 0
Do. 3 in. by 9 in.	18 10 0	...	19 10 0
Battens	14 0 0	...	15 0 0
Second yellow deals, 3 in. by 11 in	16 10 0	...	17 10 0
Do. 3 in. by 9 in.	15 0 0	...	16 0 0
Battens	11 10 0	...	12 10 0
Third yellow deals, 3in. by 11 in.	13 10 0	...	14 10 0
Do. 3 in. by 9 in.	13 0 0	...	14 0 0
Battens	10 10 0	...	11 0 0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	15 0 0	...	16 0 0
" " 3 in. by 9 in.	14 0 0	...	14 10 0
Battens	11 10 0	...	12 10 0
Second white deals, 3in. by 11in.	14 0 0	...	15 0 0
" " 3 in. by 9 in.	13 0 0	...	14 0 0
Battens	10 10 0	...	11 0 0
Pitch-pine: deals	19 0 0	...	21 0 0
Under 2 in. thick extra	0 10 0	...	1 0 0
Yellow Pine—First, regular sizes	44 0 0		upwards.
Oddments	32 0 0		"
Seconds, regular sizes	33 0 0		"
Oddments	28 0 0		"
Kurai Pine—Planks per ft. cube.	0 3 6	...	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 3 0	...	0 3 9
Small " "	0 2 6	...	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 6	...	0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	...	0 0 9½
¼ in. do. do.	0 0 7	...	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 10	...	0 1 1
Selected, Figury, per ft. super. as inch	0 1 6	...	0 2 6

WOOD (Continued).

JOINERS' WOOD (Continued)—	At per standard. £ s. d.		£ s. d.
Dry Walnut, American, per ft. super. as inch	0 0 10	...	0 1 0
Teak, per load	18 0 0	...	22 0 0
American Whitewood planks, per ft. cube	0 4 0	..	0 5 0
Prepared Flooring, etc.—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 6	...	0 17 0
1 in. by 7 in. yellow, planed and matched	0 14 0	...	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	...	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	...	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	...	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	...	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	...	0 13 6
1 in. by 7 in. " "	0 14 0	...	0 18 6
¾ in. by 7 in. white " "	0 10 0	...	0 11 0
1 in. by 7 in. " "	0 12 9	...	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.		£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	...	7 10 0
Compound Girders, ordinary sections	9 0 0	...	10 0 0
Steel Compound Stanchions	11 0 0	...	12 0 0
Angles, Tees, and Channels, ordinary sections	9 0 0	...	10 0 0
Flitch Plates	9 0 0	...	9 10 0
Cast Iron Columns & Stanchions, including ordinary patterns	7 10 0	...	8 10 0

METALS.

	Per ton, in London. £ s. d.		£ s. d.
IRON— Common Bars	8 10 0	...	9 0 0
Staffordshire Crown Bars, good merchant quality	8 15 0	...	9 5 0
Staffordshire "Marked Bars"	10 10 0	...	—
Mild Steel Bars	8 15 0	...	9 5 0
Hoop Iron, basis price	9 5 0	...	9 10 0
" " Galvanised	17 0 0	...	—

(*And upwards, according to size and gauge.)

Sheet Iron Black— Ordinary sizes to 20 g.	9 15 0	...	—
" " 24 g.	10 15 0	...	—
" " 26 g.	12 5 0	...	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15 0 0	...	—
Ordinary sizes to 22 g. and 24 g.	15 10 0	...	—
" " 26 g.	16 10 0	...	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	18 0 0	...	—
" " 22 g. and 24 g.	18 10 0	...	—
" " 26 g.	20 0 0	...	—
Galvanised Corrugated Sheets— Ordinary sizes, 6ft. to 8ft. 20 g.	14 10 0	...	—
" " 22 g. and 24 g.	14 15 0	...	—
" " 26 g.	16 5 0	...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	12 0 0	...	—
Best Soft Steel Sheets, 2 g. & 24 g.	13 0 0	...	—
" " " 26 g.	15 0 0	...	—
Cut Nails, 3 in. to 6 in. (Under 3 in., usual trade extras.)	10 10 0	...	11 0 0

LEAD, &c.

	£ s. d.		
LEAD—Sheet, English, 4lb. and up	18 0 0	...	—
Pipe in coils	18 10 0	...	—
Soil pipe	21 10 0	...	—
Compo pipe	21 10 0	...	—
ZINC—Sheet—	In casks of 10 cwt.		
Vieille Montagne	34 10 0	...	—
Silesian	33 15 0	...	—

Zinc, in bundles, 1s. per cwt. extra.

COPPER— Strong Sheet per lb.	0 1 0	...	—
Thin " "	0 1 1	...	—
Copper nails "	0 0 10	...	—
Copper wire "	0 0 10	...	—
BRASS— Strong Sheet "	0 0 11	...	—
Thin "	0 1 0	...	—
TIN—English Ingots "	0 1 10	...	—
SOLDER—Plumbers' "	0 0 8½	...	—
Tinmen's "	0 0 11	...	—
Blowpipe "	0 1 2	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

15 oz. thirds	2¼d.	26 oz. fourths	3½d.
" fourths	1¾d.	32 oz. thirds	3d.
21 oz. thirds	3d.	" fourths	4¼d.
" fourths	2¼d.	Fluted Sheet, 15 oz.	3½d.
26 oz. thirds	4d.	" 21 oz.	4¼d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

⅛ Hartley's	2d.	Figured Rolled, Oxford Rolled, Oceanic, Arctic, Muffled, and Rolled Cathedral, white	3¼d.
¼ "	2¼d.		
⅜ "	2¾d.	Ditto, tinted	3d.

Not less than three crates.

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 3 9
" " " in barrels	"	0 3 10
" " " in drums	"	0 4 0
Boiled " " in barrels	"	0 4 0
" " " in drums	"	0 4 3
Turpentine in barrels	"	0 3 3
" in drums	"	0 3 5
Genuine Ground English White Lead, per ton		22 10 0
Red Lead, Dry	"	21 0 0
Best Linseed Oil Putty	per cwt.	0 11 0
Stockholm Tar	per barrel	1 12 0

BUILDING—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

* OCTOBER 17.—**Macclesfield.**—ALTERATIONS AND ADDITIONS.—The Macclesfield Education Committee invite tenders for alterations and additions to Technical School premises. See advertisement in this issue for further particulars.

OCTOBER 19.—**Denton.**—SCHOOL.—Erection of a new elementary school. Plans seen and quantities from the County Architect, Mr. Henry Littler, 16, Ribblesdale-place, Preston. Deposit of 2*l.*

OCTOBER 19.—**Failsworth.**—SCHOOL.—Erection of a new elementary school. Plans seen and quantities from the County Architect, Mr Henry Littler, 16, Ribblesdale-place, Preston. Deposit of 2*l.*

* NOVEMBER 2.—**St. Albans.**—RESIDENCES.—The Middlesex County Council invite tenders for six pairs of semi-detached residences for asylum attendants at Napsbury, St. Albans. See advertisement in this issue for further particulars.

No DATE.—**Golcar.**—HOUSE.—Erection of a dwelling-house. Plans seen and quantities from Mr. A. Shaw, architect, Golcar.

No DATE.—**Grange-over-Sands.**—RESIDENCE.—Erection of a doctor's residence at the Meathop Sanatorium. Plans and quantities from Mr. John Hutton, M.R.S.I., architect, Kendal.

No DATE.—**Millsborough.**—SHOPS, ETC.—Erection of shops and office buildings in Holme-lane. Quantities from the architect on deposit of 2*l.* 2*s.* Mr. J. W. Winter, architect, St. Peter's Close, Sheffield.

No DATE.—**Keighley.**—MOTOR WORKS.—Erection of a motor works. Messrs. J. B. Bailey & Son, architects, 3, Scott-street, Keighley.

No DATE.—**Lepton.**—HOUSES.—Erection of eight dwelling-houses in Wakefield-road, Tandem. Plans, specification, and quantities from Messrs. Brook, Dransfield, & Dyson, architects and surveyors, Estate-buildings, Huddersfield.

No DATE.—**Maryborough.**—SCHOOLS.—Erection of schools. Plans and specification seen, and quantities from Mr. James Mackey, 58, Dame-street, Dublin, on deposit of 1*l.* 1*s.* Mr. Francis Bergin, Borough Engineer, 36, Westmoreland-street, Dublin.

No DATE.—**Ogmore Vale.**—OFFICES.—Erection of offices at Ogmore Vale for Messrs. the Lewis-Merthyr Consolidated Colliery Company, Ltd. Quantities, on deposit of 2*l.* 2*s.*, from Mr. James T. Jenkins, M.S.A., architect and surveyor, Porth, Glam.

No DATE.—**Wakefield.**—INSTITUTE, ETC.—Erection of a men's institute and extension of Clarendon-street schools. Messrs. Massie & Holdsworth, architects and surveyors, Tetley House, Wakefield.

No DATE.—**Wayland.**—INFIRMARY.—Erection of new infirmary buildings. Quantities from the architect, Mr. Herbert J. Green, of 31, Castle Meadow, Norwich. Deposit of 5*l.* 5*s.*

No DATE.—**West Wylam-on-Tyne.**—HALL ETC. Erection of miners' hall, etc. Messrs. W. Dixon & Son, architects, Bigg Market, Newcastle.

ENGINEERING, IRON, AND STEEL.

SEPTEMBER 26.—**Belfast.**—ELECTRIC INSTALLATION.—Installation of conductors and equipment at the new abattoir. Plans and conditions seen, and specification from the City Surveyor. Deposit of 1*l.* 1*s.*

SEPTEMBER 27.—**Ashford.**—BRIDGE.—Alterations and additions to the Wye Bridge. Quantities and tender form from Mr. F. W. Ruck, County Architect, 86, Week-street, Maidstone.

SEPTEMBER 28.—**Diss.**—WATERWORKS.—For construction of waterworks. Specifications from the engineer, Mr. W. H. Booth, 38, Broad-street-avenue, London, E.C. Deposit of 3*l.*

SEPTEMBER 30.—**Hebburn.**—BRIDGE.—Construction of a light steel bridge across the Wallsend and Hebburn Coal Company's railway. Surveyor, Mr. H. Paterson, Council Offices, Hebburn.

SEPTEMBER 30.—**Langholm.**—WATERWORKS.—Construction of waterworks, reservoir, etc. Plans seen, and specification and quantities, on deposit of 3*l.* 3*s.*, from the engineers, Messrs. Taylor & Wallin, Cathedral-buildings, Newcastle-on-Tyne.

SEPTEMBER 30.—**Liverpool.**—LIFTS, ETC.—Electric lifts, electric lighting, and sanitary fittings at the workhouse, Brownlow-hill. Mr. G. W. Coster, Vestry Clerk, Parish Offices, Brownlow-hill, Liverpool.

OCTOBER 16.—**Hastings.**—LIGHTING.—For electric light installation at the workhouse. Specification and form of tender from Mr. S. Bumstead, Acting Clerk, 11, Wellington-square, Hastings.

DECEMBER 30.—**Newport, Mon.**—BRIDGE.—Construction of a ferro-concrete bridge across the river Usk. Particulars from Mr. H. Tremelling, A.M.Inst.C.E., Borough Engineer, Town Hall, Newport.

FURNITURE, PAINTING, MATERIALS, etc.

SEPTEMBER 23.—**Whitby.**—PAINTING.—For cleaning and painting the iron bridge, near Glaisdale station. Mr. J. Lyth, Surveyor, Union Offices, Church-street, Whitby.

SEPTEMBER 25.—**Huddersfield.**—PAINTING.—For various painting works for the Corporation. Specifications seen and quantities from Mr K. F. Campbell, M.Inst.C.E., Borough Engineer and Surveyor, 1, Peel-street.

SEPTEMBER 26.—**Oldham.**—PAINTING.—For painting and decorating at the Gas and Water Offices. Specifications from Mr. A. Andrew, general manager.

OCTOBER 3.—**Exmouth.**—PAINTING.—For painting kitchen, pantry, and scullery at the Exmouth Cottage Hospital. Mr. L. Tracey, Hon. Sec.

ROADS, SANITARY AND WATER WORKS.

SEPTEMBER 23.—**Bedwellty.**—GRANITE, ETC.—Supply of broken limestone and granite. Forms of tender from the Council's Surveyor, Mr. J. H. Lewis, A.M.Inst.C.E., Blackwood, Mon.

SEPTEMBER 23.—**New Tredegar.**—SEWER.—Construction of a 9-in. sewer. Plans from the Surveyor, Mr. J. H. Lewis, A.M.Inst.C.E., Blackwood, Mon.

SEPTEMBER 25.—**Alfreton.**—GRANITE, ETC.—For supply of granite edge kerb and concrete flags. Specification from Mr. R. F. Ward, Surveyor to the Council, King-street, Alfreton.

SEPTEMBER 25.—**Ilford.**—CEMENT.—Supply of cement. Particulars from Mr. H. Shaw, M.Inst.C.E., Surveyor to the Council, Town Hall, Ilford.

SEPTEMBER 25.—**Warrington.**—CUBES.—Supply of granite cubes. Specifications from Mr. T. Longdin, Borough Engineer and Surveyor, Town Hall, Warrington.

SEPTEMBER 26.—**Derby.**—ROADS.—For various street works. Plans and specification seen, and quantities from Mr. John Ward, M.Inst.C.E., Borough Surveyor, Borough Surveyor's Office, Babington-lane, Derby.

SEPTEMBER 26.—**Manwell.**—MATERIALS.—Supply of materials, etc. Mr. P. Scott, Clerk, Council Offices, Manwell, W.

* SEPTEMBER 26.—**Kilburn.**—WOOD PAVING.—The Willesden D.C. invite tenders for wood paving in Dyne-road. See advertisement in this issue for further particulars.

SEPTEMBER 26.—**Sowerby Bridge.**—STREETS.—For various street works. Quantities from Mr. G. E. Wrigley, Engineer's Office, Sowerby Bridge, Yorks.

SEPTEMBER 27.—**Cardiff.**—STREETS.—For making up streets. Drawings and specifications seen and forms of tender from the City Engineer, City Hall, Cardiff.

SEPTEMBER 27.—**Padiham.**—PIPES.—Supply and delivery of cast-iron pipes. Specification and form of tender from Mr. J. Gregson, Engineer and Surveyor, Town Hall, Padiham.

SEPTEMBER 29.—**Bexhill.**—PAVING.—For paving footpaths. Specification and form of tender from Borough Surveyor, Town Hall, Bexhill.

OCTOBER 2.—**Bolton-upon-Dearne.**—STREETS.—For private street works. Specifications seen and quantities on deposit of 1*l.* 1*s.*, from the Surveyor, Council Buildings, Bolton-upon-Dearne.

OCTOBER 2.—**Bromsgrove.**—SEWERAGE.—Construction of sewers at Barnt Green and enlargement of sewage disposal works at Alvechurch. Drawings, specification, and quantities from the engineer, Mr. William Fiddian, F.S.I., Old Bank Offices, Stourbridge. Deposit of 3*l.* 3*s.*

OCTOBER 2.—**Enniskillen.**—METAL.—For supply of road metal. Mr. A. W. G. Ritchie, Town Clerk, Town Hall, Enniskillen.

OCTOBER 3.—**Dundalk.**—DRAINAGE.—The Great Northern Railway Company (Ireland) invite tenders for carrying out of drainage scheme in the Dundalk station premises and buildings. Drawings and specification at the Chief Engineer's Office, Amiens-street Terminus, Dublin, and District Engineer's Office, Belfast. Quantities and forms of tender on deposit of 2*l.* 2*s.* from Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin.

* OCTOBER 3.—**Ealing.**—ROAD-MAKING.—The Ealing Town Council invite tenders for making up of various roads. See advertisement in this issue for further particulars.

OCTOBER 3.—**Watford.**—ROADS.—For making-up roads. Plans and specifications seen at the Council Offices, and quantities from Mr. D. Waterhouse, Engineer and Surveyor to the Council, on deposit of 1*l.* Council Offices, 14, High-street, Watford.

* OCTOBER 4.—**London, S.W.**—ROADS, ETC.—The Commissioners of H.M. Works and Public Buildings invite tenders for completion of roads, etc., round generating station at Imperial Institute, South Kensington. See advertisement in this issue for further particulars.

OCTOBER 4.—**Maldon.**—PAVING.—For paving and kerbing footway. Plan and specification seen, and form of tender from Mr. T. R. Swales, Borough Surveyor, Maldon, Essex.

OCTOBER 9.—**Batley.**—PAVING, ETC.—For the levelling, paving, channelling, and completing of Bank Foot-place. Plans and specifications with the Borough Engineer and Surveyor (Mr. Oscar J. Kirby), Town Hall, Batley.

OCTOBER 9.—**Bury.**—SEWER.—Construction of brick sewer. Drawings seen, and specification and quantities from the Borough Engineer, on deposit of 2*l.*

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*CLERK OF WORKS	Rochford Union	3*l.* 3*s.* per week	Sept. 25

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*DEALS, BATTENS, BOARDS, TIMBER, ETC.—Great Hall, Winchester House, E.C.	Churchill & Sim	Sept. 27
*PLANT AND MACHINERY, COUNTY HALL SITE, S.E.—On the Premises	H. J. Bromley	Sept. 28
*BLDG. & AGRI. LAND, SITE OF SANITM., RESI., ETC., BEXHILL-ON-SEA—At the Mart	Debenham, Tewson, Richardson, & Co.	Oct. 10
*FREEHOLD BUILDING SITE, GT. ST. HELEN'S, E.C.—At the Mart	Edwin Fox, Bousfield, Burnetts, & Baddeley	Oct. 18
*FREEHOLD BLDG. EST., STABLING, & COTTGS., TOOTING & HACKBDG.—At the Mart	Debenham, Tewson, Richardson, & Co.	Oct. 24
*FREEHOLD BUILDING LAND, FULHAM—Estate Room, 20, Hanover-square, W.	Knight, Frank, & Rutley	Nov. 8

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 2.—By SEXTON & GRIMWADE.

Peldon, Essex.—Games farm, 20 a. 2 r. 23 p., *f.* £310

September 4.—By SEXTON & GRIMWADE.

Groton, Suffolk.—Groton Hall Estate, 14 acres, *f.* 3,050

September 5.—By E. S. BEARD & DANIELL.

Colchester, Essex.—Butt-rd., Lord Cardigan Inn and shop adjoining, *f.* 425

15, 16, 17, 86, 87, and 88, Albert-st., and 23, Albert-rd., *f.* 900

September 6.—By KIVELL & HARRIS.

St. Gennys, Cornwall.—Crackington Manor Estate, 2,109 acres, *f.* 17,366

By J. HANNAFORD & SON.

Winkleigh, Devon.—Riddlestone and West Luxton Farm, 170 a. 2 r. 21 p., *f.* £3,010

September 7.—By J. HANNAFORD & SON.

Morchard Bishop, Devon.—Cottage and 1 acre, *f.* 220

By E. J. GILDERS & Co.

Frating, Essex.—Hill Farm, 43 a. 2 r. 3 p., *f.* 960

By ELLIOTT & SONS.

Preston, Sussex.—28 and 34, Preston rd., *f.*, y.r. 70*l.* 1,035

23, Stanford-av., *f.*, y.r. 65*l.* 810

16, Campbell-rd., *f.*, w.r. 32*l.* 10*s.* 325

154, Havelock-rd., *f.*, e.r. 26*l.* 340

Brighton, Sussex.—10, Pelham-st., *f.*, w.r. 27*l.* 6*s.* 240

By BARBER & SON.

Rodington, Salop.—Rodington Estate (part of), 915 acres, *f.* 28,893

September 11.—By HAMPTON & SONS.

Ashford Carbonell, Salop.—Accommodation land, cottages, and 36 a. 0 r. 39 p., *f.* £3,30[illegible]

September 12.—By MADDISON, MILES, & MADDISON.

Yarmouth.—31, Nelson-rd. North, *f.* 61[illegible]

By DREWEATT & WATSON.

Thatcham, Berks.—Five cottages, *f.* 37[illegible]

September 12.—By SCOTT PITCHER.

Chailey, Sussex.—Mascalls Farm, 4 a. 3 r. 30 p., *f.* and c. 50[illegible]

September 14.—By GRIMLEY & SON.

Bournville, Worcs.—186, 188, and 190, Beaumont-road, u.t. 82 yrs., g.r. 12*l.*, w.r. 58*l.* 1*s.* 37[illegible]

Erdington, Warwick.—43, Holliday-rd., u.t. 112 yrs., g.r. 4*l.*, w.r. 36*l.* 12*s.* 24[illegible]

King's Norton, Warwick.—55 to 77 (odd), —France-rd., s.—86 yrs., g.r. 29l., w.r. 127l. 12s. £790

Shirley, Warwick.—11, 13, and 15, Charlotte-rd., n.t. 86 yr., g.r. 13l., w.r. 42l. 18s. 140

Handsworth, Staffs.—81, 83, and 85, Douglas-rd., n.t. 76 yrs., g.r. 12l., w.r. 55l. 6s. 190

Ladywood, Birmingham.—207 to 213 (odd), St. Vincent-st., n.t. 43 yrs., g.r. 37l., w.r. Mill 19 750

Small Heath, Worcs.—111, Golden Hillock-rd., n. 33 yrs., g.r. 4l. 15s. 6d., y.r. 22l. ... 230

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; f.g.r. for forehold ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for premises; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; h. for house; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; h.h. for beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to "THE PUBLISHER," and not to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River.	£	s.	d.
Best Stocks	1	13	0
Picked Stocks for Facings	2	7	0

Per 1000, Delivered at Railway Depôt.

	£	s.	d.		£	s.	d.
Flettons	1	9	0	Double Headers	13	7	6
Best Fareham Red	3	12	0	One Side and two Ends	17	7	6
Best Red Pressed Bath Facing	5	0	0	Two Sides and one End	18	7	6
Best Blue Pressed Staffordshire	3	15	0	Splays & Squints	15	17	6
Do. Bullnose	4	0	0	Best Dipped Salt Glzd. Str'tch'rs	10	17	6
Best Stourbridge Fire Bricks	3	14	0	Headers	10	7	6
GLAZED BRICKS.				Quoins, Bullnose, and Flats	14	7	6
Best White and Ivory Glazed Stretchers	10	17	6	D'ble Stretchers	16	7	6
Headers	10	7	6	Double Headers	13	7	6
Quoins, Bullnose, and Flats	14	7	6	One Side and two Ends	17	7	6
D'ble Stretchers	16	7	6	Two Sides and one End	18	7	6
				Splays & Squints	15	17	6

Second Quality White and Dipped Salt Glazed, £1 5s. per 1000 less than best.

	s.	d.	
Thames and Pit Sand	6	9	per yard, delivered.
Thames Ballast	5	3	" "
Best Portland Cement	29	0	per ton, "
Best Ground Blue Lias Lime	19	0	" "

NOTE—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s. 6d. per yard delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly dpt.

STONE.

Per Ft. Cube.

	s.	d.
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	3	1
White Basebed, delivered on road waggons Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	3½

Per Ft. Cube, delivered at Railway Depôt.

	s.	d.		s.	d.
Ancaster in blocks	1	10	Closeburn Red Freestone	2	0
Beer in blocks	1	6	Red Mansfield Freestone	2	4
Greenshill in blocks	1	10	Talacre & Gwespyr Stone	2	8
Darley Dale in blocks	2	4			
Red Corsehill in blocks	2	3			

STONE (Continued).

	s.	d.
YORK STONE—Robin Hood Quality. Per Ft. Cube, Delivered at Railway Depôt.		
Scappled random blocks	2	10
Per Ft. Super., Delivered at Railway Depôt.		
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3
6 in. rubbed two sides ditto, ditto	2	6
3 in. sawn two sides slabs (random sizes)	0	11½
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7
1¼ in. to 2 in. ditto, ditto	0	6
HARD YORK— Per Ft. Cube, Delivered at Railway Depôt.		
Scappled random blocks	3	0
Per Ft. Super., Delivered at Railway Depôt.		
6 in. sawn two sides landing to sizes (under 40 ft. super.)	2	8
6 in. rubbed two sides ditto	3	0
3 in. sawn two sides slabs (random sizes)	1	2
2 in. self-faced random flags	0	5

SLATES.

Per 1000 of 1200 at Railway Depôt.

In. In.	£	s.	d.	In. In.	£	s.	d.
20×10 best blue Bangor	13	2	6	20×10 best Eur'ka unfading green	15	17	6
20×12 ditto	13	17	6	20×12 ditto	13	7	6
20×10 1st quality ditto	13	0	0	18×10 ditto	13	5	0
20×12 ditto	13	15	0	16×8 ditto	10	5	0
16×8 ditto	7	5	0	20×10 permanent green	11	12	6
22×10 best blue Portmadoc	12	12	6	18×10 ditto	9	12	6
16×8 ditto	6	12	6	16×8 ditto	6	12	6

TILES.

At Railway Depôt.

	s.	d.		s.	d.
Best plain red roofing (per 1000)	42	0	Best "Hartshill" brand, plain sand-faced (per 1000)	50	0
Hip and Valley (per doz.)	3	7	Do. pressed (per 1000)	47	6
Best Broseley (per 1000)	50	0	Do. Ornamental (per 1000)	50	0
Do. Ornamental (per 1000)	52	6	Hip (per doz.)	4	0
Hip and Valley (per doz.)	4	0	Valley (per doz.)	3	6
Best Ruabon red, brown, or brindled (Edw'ds) (per 1000)	57	6	Staffords. (Hanley) Reds or Brindled (per 1000)	42	6
Do. Ornamental (per 1000)	60	0	Hand-made sand-faced (per 1000)	45	0
Hip (per doz.)	4	0	Hip (per doz.)	4	0
Valley (per doz.)	3	0	Valley (per doz.)	3	6

WOOD.

BUILDING WOOD. At per standard.	£	s.	d.		£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14	0	0	...	15	10	0
Deals: best 3 by 9	13	10	0	...	14	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	...	12	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	...	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best.			
Battens: seconds	0	10	0	"		"	
2 in. by in. and 2 in. by 6 in.	9	10	0	...	10	10	0
2 in. by 4½ in. and 2 in. by 5 in.	9	0	0	...	10	0	0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.			
½ in.	1	0	0	"			
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 5	0	0	...	5	10	0
Seconds	4	10	0	...	5	0	0
Small timber (8 in. to 10 in.)	3	17	6	...	4	0	0
Small timber (6 in. to 8 in.)	3	5	0	...	3	10	0
Swedish balks	2	12	6	...	3	0	0
Pitch-pine timber (30 ft. average)	4	10	0	...	5	5	0

JOINERS' WOOD. At per standard.	£	s.	d.		£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in.	24	10	0	...	25	10	0
3 in. by 9 in.	22	10	0	...	23	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	...	18	0	0
Second yellow deals, 3in. by 11in.	19	0	0	...	20	0	0
" " 3 in. by 9 in.	18	0	0	...	19	10	0
Battens, 2½ in. and 3in. by 7 in.	14	0	0	...	15	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	14	0	0	...	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	...	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	10	0	...	22	10	0
Do. 3 in. by 9 in.	18	10	0	...	19	10	0
Battens	14	0	0	...	15	0	0
Second yellow deals, 3 in. by 11 in.	16	10	0	...	17	10	0
Do. 3 in. by 9 in.	15	0	0	...	16	0	0
Battens	11	10	0	...	12	10	0
Third yellow deals, 3in. by 11 in.	13	10	0	...	14	10	0
Do. 3 in. by 9 in.	13	0	0	...	14	0	0
Battens	10	10	0	...	11	0	0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	15	0	0	...	16	0	0
" " 3 in. by 9 in.	14	0	0	...	14	10	0
Battens	11	10	0	...	12	10	0
Second white deals, 3in. by 11in.	14	0	0	...	15	0	0
" " 3 in. by 9 in.	13	0	0	...	14	0	0
Battens	10	10	0	...	11	0	0
Pitch-pine: deals	19	0	0	...	21	0	0
Under 2 in. thick extra	0	10	0	...	1	0	0
Yellow Pine—First, regular sizes	44	0	0	upwards.			
Oddments	32	0	0	"			
Seconds, regular sizes	30	0	0	"			
Oddments	28	0	0	"			
Kurai Pine—Planks per ft. cube	0	3	6	...	0	5	0
Danzig and Stettin Oak Logs— Large, per ft. cube	0	3	0	...	0	3	9
Small " "	0	2	6	...	0	2	6
Wainscot Oak Logs, per ft. cube	0	5	6	...	0	6	0
Dry Wainscot Oak, per ft. sup. as inch	0	0	8½	...	0	0	9½
½ in. do. do.	0	0	7	...		—	
Dry Mahogany—Houndras, Tabasco, per ft. super. as inch	0	0	10	...	0	1	1
Selected, Figury, per ft. super. as inch	0	1	6	...	0	2	6

WOOD (Continued).

JOINERS' WOOD (Continued)— At per standard.	£	s.	d.		£	s.	d.
Dry Walnut, American, per ft. super. as inch	0	0	10	...	0	1	0
Teak, per load	18	0	0	...	22	0	0
American Whitewood planks, per ft. cube	0	4	0	...	0	5	0
Prepared Flooring, etc.— Per square.							
1 in. by 7 in. yellow, planed and shot	0	13	6	...	0	17	0
1 in. by 7 in. yellow, planed and matched	0	14	0	...	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	...	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	...	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	...	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	...	0	16	6
⅞ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	...	0	13	6
1 in. by 7 in. " "	0	14	0	...	0	16	6
⅞ in. by 7 in. white " "	0	10	0	...	0	11	0
1 in. by 7 in. " "	0	12	9	...	0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.		£	s.	d.
Rolled Steel Joists, ordinary sections	7	0	0	...	7	10	0
Compound Girders, ordinary sections	9	0	0	...	10	0	0
Steel Compound Stanchions	11	0	0	...	12	0	0
Angles, Tees, and Channels, ordinary sections	9	0	0	...	10	0	0
Flitch Plates	9	0	0	...	9	10	0
Cast Iron Columns & Stanchions, including ordinary patterns	7	10	0	...	8	10	0

METALS.

	Per ton, in London. £	s.	d.		£	s.	d.
IRON— Common Bars	8	10	0	...	9	0	0
Staffordshire Crown Bars, good merchant quality	8	15	0	...	9	5	0
Staffordshire "Marked Bars"	10	10	0	...	—		
Mild Steel Bars	8	15	0	...	9	5	0
Hoop Iron, basis price	9	5	0	...	9	10	0
" " Galvanised	17	0	0	...	—		
("And upwards, according to size and gauge.)							
Sheet Iron Black— Ordinary sizes to 20 g.	9	15	0	...	—		
" " 24 g.	10	15	0	...	—		
" " 26 g.	12	5	0	...	—		
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15	0	0	...	—		
Ordinary sizes to 22 g. and 24 g.	15	10	0	...	—		
" " 26 g.	16	10	0	...	—		
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	18	0	0	...	—		
" " 22 g. and 24 g.	18	10	0	...	—		
" " 26 g.	20	0	0	...	—		
Galvanised Corrugated Sheets— Ordinary sizes, 6ft. to 8ft. 20 g.	14	10	0	...	—		
" " 22 g. and 24 g.	14	15	0	...	—		
" " 26 g.	16	5	0	...	—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	12	0	0	...	—		
Best Soft Steel Sheets, 2 g. & 24 g.	13	0	0	...	—		
" " " 26 g.	15	0	0	...	—		
Cut Nails, 3 in. to 6 in.	10	10	0	...	11	0	0
(Under 3 in., usual trade extras.)							

LEAD, &c.

	£	s.	d.		
LEAD—Sheet, English, 4lb. and up	18	0	0	...	—
Pipe in coils	18	10	0	...	—
Soil pipe	21	10	0	...	—
Compo pipe	21	10	0	...	—
ZINC—Sheet—	In casks of 10 cwt.				
Vielle Montagne	34	10	0	...	—
Silesian	33	15	0	...	—
Zinc, in bundles, 1s. per cwt. extra.					
COPPER— Strong Sheet per lb.	0	1	0	...	—
Thin " "	0	1	1	...	—
Copper nails "	0	0	10	...	—
Copper wire "	0	0	10	...	—
BRASS— Strong Sheet "	0	0	11	...	—
Thin "	0	1	0	...	—
TIN—English Ingots "	0	1	10	...	—
SOLDER—Plumbers' "	0	0	8½	...	—
Tinmen's "	0	0	11	...	—
Blowpipe "	0	1	2	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

15 oz. thirds	2¼d.	26 oz. fourths	3½d.
" fourths	1½d.	32 oz. thirds	3d.
21 oz. thirds	3d.	" fourths	4½d.
" fourths	2½d.	Fluted Sheet, 15 oz.	3½d.
26 oz. thirds	4d.	" 21 oz.	4½d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

⅛ Hartley's	2d.	Figured Rolled, Oxford Rolled, Oceanic, Arctic, Muffled, and Rolled Cathedral, white	3½d.
¼ "	2½d.		
⅜ "	3½d.	Ditto, tinted	5d.

Not less than three crates.

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	3	9
" " " in barrels	"	0	3	10
" " " in drums	"	0	4	0
Boiled " in barrels	"	0	4	0
" " " in drums	"	0	4	3
Turpentine in barrels	"	0	3	3
" in drums	"	0	3	5
Genuine Ground English White Lead, per ton		22	10	0
Red Lead, Dry	"	21	0	0
Best Linseed Oil Putty	per cwt.	0	11	0
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 6
Fine Elastic Carriage	0 12 0
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 10 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flating Varnish	0 18 0
White Pale Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 0
Berlin Black	0 16 0
Knotting	0 10 9
French and Brush Polish	0 10 6

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursday. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100l. unless in some exceptional cases and for special reasons.]

*Denotes accepted. †Denotes provisionally accepted.

ABERHILL.—For new school, for Wemyss School Board. Mr. G. Charles Campbell, Architect, Methil:—

Mason: J. Farmer, Methil*	£3,663 12 8
Joiner: D. Dewar, Methil*	2,812 8 3
Smithwork: Barnet & Morton, Kirkcaldy*	158 12 3
Plumber: W. Nicol, Buckhaven*	872 0 0
Slater: W. Currie, Kirkcaldy*	433 7 9
Plasterers: J. & T. Stobie, Buckhaven*	980 12 9
Asphaltwork: W. G. Walker & Sons, Edinburgh*	378 4 7
Tilework: Allan & Sons, Edinburgh*	363 17 6
Glaziers: T. Coutts & Sons, Kirkcaldy*	112 16 1
Painter: T. McFarlane, Methil*	245 0 0

BRACKNELL.—For cottage and stabling at Bracknell, for Mr. G. Panter. Mr. Cecil H. Perkins, A.R.I.B.A., architect, Church-road, Bracknell, Berks:—

—	Cottage. £ s. d.	Stable. £ s. d.	Total. £ s. d.
H. Charman	656 0 0	149 0 0	805 0 0
G. Brown	632 0 0	129 6 9	761 6 9
T. Cotterell	575 10 0	110 0 0	685 10 0
Payne & Co.	540 0 0	90 0 0	630 0 0
G. Davis	515 0 0	113 0 0	628 0 0
Exors. of the late J. B. Seward, Wokingham*	Not divided.		584 0 0

BULPHAN.—For the erection of the first homestead in connexion with the Smallholding Co-operative Colony, Church-lane, Bulphan, near Romford. Mr. J Williams Dunford, architect, 100c, Queen Victoria-street, E.C.:—

Brown Bros.	£594	H. J. Carter, Ltd	£509
C. Manning	560	W. T. & J. Cooper, Newington Causeway, S.E., and at Bulphan†	494
F. J. Coxhead	550		
Snewin Bros. & Co.	548		
J. Brand	525		

DOVER.—For erection of an infants' school at Bulwark Hill. Mr. W. C. Hawke, Borough Engineer, Dover:—

G. H. Denne & Son	£3,413 0 0	S. R. Spinner	£3,024 0 0
Paramors, Ltd.	3,323 13 3	T. T. Denne	2,987 0 0
W. J. Ballard	3,150 0 0	R. J. Barwick	2,944 0 0
G. Lewis & Sons	3,087 0 0	T. C. Gluyas	2,890 0 0
A. Tapley	3,069 0 0	W. H. Grigg, Dover*	2,872 0 0
Hayward & Paramor	3,027 0 0		

EXETER.—For alterations and additions to the workhouse laundry. Mr. R. M. Challice, architect, 14, Bedford-circus, Exeter:—

J. W. Castle	£547 14 0	Popman	£519 0 0
G. Setter & Son	543 14 11	Soper, Magdalen Bridge, Exeter*	306 0 0
Ham & Passmore	537 6 0		
G. Herbert	522 0 0		

FARNBOROUGH.—For erection of a fire-station. Mr. J. R. Hargreaves, Surveyor, Town Hall, Farnborough:—

A. Johnson	£631 0 0	Drowley & Co.	£535 0 0
W. Watson	630 0 0	E. C. Hughes	525 0 0
A. Crockerell	612 0 0	D. & H. J. Poulter	510 0 0
Caesar Bros.	607 0 0	G. Kemp & Co.	498 0 0
J. Seward	598 0 0	T. G. Smith	450 0 0
A. J. Galsworthy	585 0 0	Crosley & Co.	425 0 0
W. Wellsking	583 13 0	Jones Bros., Farnborough*	399 2 6
Martin, Wells, & Co.	549 0 0		

HOVE.—For constructing a ward block and other work at the Infectious Diseases Hospital, Portslade. Mr. Hugh Hamilton Scott, Borough Surveyor, Hove:—

J. & M. Patrick, Point Pleasant, Wandsworth*	£2,579

KEIGHLEY.—For additions to laundry. Messrs. J. Haggas & Sons, architects, North-street, Keighley:—

Mason and Joiner: H. V. Robinson, Ltd., Keighley*	£353
Slaters: W. H. & E. Walton, Keighley*	
Concretor: A. Emmott, Keighley*	
Ironwork: Jonathan Gill, Keighley*	
Pat. Glazing: W. H Heywood & Co., Huddersfield*	

KEIGHLEY.—For additions to brewery. Messrs. J. Haggas & Sons, architects, North-street, Keighley:—

Masons: A. & W. Sharp, Oakworth, near Keighley*	£1,654 15
Joiner: W. Steel, Apsley-street, Keighley*	
Slater: W. Thornton, Bingley*	
Plasterer: J. Boot, Keighley*	
Plumbers: W. & J. Harrison, Ltd., Keighley*	
Ironwork: J. Gill, Keighley*	
Concretor: J. Cooke, Huddersfield*	

LARGO.—For waterworks, for Fifeshire County Council. Messrs. Bruce & Proudfoot, civil engineers, 67, Crossgate, Cupar:—

A. H. Robertson	£980 9 11	J. Farner	£816 15 6
W. G. Hett	897 7 9	J. Martin	787 5 11
D. Gilmour	893 6 4	G. Simpson	759 18 3
J. & J. Street	872 6 3	A. M. White & Son	751 1 1½
J. Ritchie	855 17 10	J. Strachan & Son, Chance Inn, Cupar*	695 2 2½
R. C Brebner & Co.	833 11 5		
R. J. Morrison	818 14 10		
A. Gray & Co.	817 14 9		

SALISBURY.—For erection of a motor garage and residence, for Mr. A. M. Edwards. Mr. A. C. Bothams, architect, 32, Chipper-lane, Salisbury. Quantities by architect:—

Roles & Sons	£1,220 0	Vincent & Pollard	£1,075 10
W. S. Harris	1,190 10	Wort & Day	1,025 0
Kite & Sons	1,153 10	Smith & Bundy, Bemerton*	970 0
T. Dawkins	1,080 0		
C. Mitchell	1,080 0		
E. T. Jenkins	1,060 9		

SHEFFIELD.—For erection of buildings in Charlotte-street and Portobello-street. Messrs. Gibbs, Flockton, & Teather, architects, Sheffield:—

Dawson, Jones, & Co.	£33,659	T. Wilkinson & Sons	£31,120
D. O'Neill & Son	33,500	J. Fidler Ltd	31,064
G. Carr	32,299	J. Vasey & Son	30,823
Ash, Son, & Biggin	31,850	G. Longden & Son, Ltd.	30,700
J. Eshelby & Son	31,300	W. R. Unwin	30,448
D. Sheldon	31,294	T. Roper & Sons, Ltd.	29,879
B. Powell & Son	31,278	H. Boot & Sons, Ltd., Ecclesfield*	29,457
W. & A. Forsdike	31,250		
H. Frockingham & Sons	31,229		

SUNBURY.—For extensions of church wharf. Mr. H. F. Coales, Council Surveyor, Sunbury:—

R. C. Brebner & Co.	£504 18 0	S Kavanagh & Co.	£438 3 3
Allen & Long	582 0 0	Leggott & Speight	427 8 9
T. W. Pedrette	529 5 0	Airds, Ltd.	399 9 1
J. Shelbourne & Co.	481 0 0	A. Roberts	351 6 11
W. F. Vinter	454 16 4		

[Surveyor's estimate, £450.]

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